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VI. RUBUS: ENUMERATIO NATIVORUM EUBATORUM IN AMERICA SEPTENTRIONALI

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Occasional Papers on the Kinds of Plants

By L. H. BAILEY

VI. Rubus: Enumeration of the Eubati (dewberries and blackberries) native in North America.

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VI. THE EUBATI NATIVE IN NORTH AMERICA

The Eubatus section of Rubus is commonly considered to be the most difficult group of plants in the North American flora. In fact, probably most botanists regard it as hopeless from the point of view of identification. It is admittedly perplexing; but when the genus has not been obscured by excessive subdivision on small arbitrary characters, the greater part of the difficulty is due simply to poor specimens.

The American blackberries and dewberries have biennial canes. The character of foliage and armature on the first-year canes or turions is usually unlike that on the two-year-old or bearing canes. No careful diagnosis is possible without the two years' evidence *from the same plant.* The complete specimen, therefore, comprises evidence of the turion or new growth and of the parts of the two-year-old cane *taken at the same time.* And care must be exercised not to mistake a leafy shoot of a two-year cane for a turion. And, moreover, a piece of a turion showing one or two leaves is not sufficient. The tip of the turion is often significant: enough of the turion should be taken *to show what it is like.* And yet again, a little snip from a bearing cane is not sufficient: enough of this cane, too, should be taken *to show what it is like.*

We should really distinguish three parts rather than two, the third foliage form being the sterile verdurous shoots on the two-year cane; sometimes the two-year cane is wholly sterile and it then may be mistaken for a turion. In our diagnoses we have not given much attention to the foliage from the old sterile parts, but we shall do so when we come to more careful studies and when collections shall have given us comparable material.

Another perplexity lies in the dimorphism of the inflorescence in many of the species. The main or what may be called the primary flower-clusters usually have a rather definite character; but other clusters, usually lower down on the cane, may be quite different, and if these alone are taken the student may be misled.

Little pieces of Rubi may look very much alike, but when ample material is in hand, and particularly when the plants are seen in the wild, they may be found to represent very different things.

Moreover, the label should indicate, aside from usual habitat and stature, whether the canes are erect, arching, recurving, prostrate, trailing, rooting at the tip, if the specimen itself does not show these facts.

One must not be misled by old canes that have been lopped over by snow or by burden of fruit, when the natural habit may be arching or nearly erect.

Another caution for the study of Rubus lies in the fact that the plants usually make large patches by asexual propagation from a single seedling; this seedling may take on undue importance thereby. Patches or colonies of what ought by every useful criterion to be regarded as a single species may have marked differences even when growing side by side, exhibited in armature, stature, fruit and perhaps other features; these features are persistent as long as the colony lives; one may observe them year after year.

With this amount of diligence applied to the collecting of Rubus, with the effort to practice as much discrimination as with other plants, and with the desire to arrive at a taxonomic view rather than merely to name and describe forms, the larger part of the difficulty in the genus would vanish. I know of no other plants in the North American phenogamic flora habitually so poorly collected as the Rubi.

Excepting in a few localities, the Rubi of North America have not yet been collected. They are passed by, and the eye has not been trained to the differences. We have also been taught to pay chief attention to minor arbitrary marks. We should be able to found the species of Rubus on general characters and facies, as in other plants. We ought to be careful not to divide too minutely. In such widespread and plastic genera, still probably undergoing active evolution, the units whether of groups or species should be kept rather large and inclusive if the phytography is to remain understandable.

On the other hand, one real reason for our confusion is the fact that we have recognized too few species.

In such groups as Rubus, however, we must perhaps develop a somewhat different approach toward what we are accustomed to call "species." We cannot hope for the definiteness that may be possible in many other genera. We may not expect ever to be able to name categorically every Rubus that comes to hand, nor does it follow that such specimens are to be regarded as new species. We must outgrow the idea that every individual plant must submit to a definite taxonomic nomenclature and a bibliographic classification; and this caution does not apply to Rubus alone. To be sure, we must record the minor differences in plants, but it does not follow that we are to Latin-name all these differences. If we attempt it we not only vastly overload the literature but two other dangers confront us: we split things up so small that the designations have no utility, or we carry out the Latin formulæ below the variety into numerous step-down categories. Latin designations, as an accompaniment of

binomial nomenclature, should never go beyond the third place, and it is a question whether they should go beyond the second (var.). We should find other ways to designate smaller subdivisions. The products of plant-breeders are specially to be considered in this connection.

One comes now and then on Rubus colonies that belong to nothing. These aberrants have not been studied and, if collected at all, are likely to be put aside as puzzles. They may be species, nascent species, or kinds of nonconformities not yet accounted for in our philosophies. There are four ways of disposing of such plants: (1) Ignore them: this is the easiest way. (2) Throw them loosely or uncritically into some recognized species: this extends the confusion. (3) Assume that they are "hybrids," even though the origin may be wholly unknown or even unindicated: I discuss this question in subsequent pages. (4) Give them name and diagnosis: this puts them on record; the origin is another question, for a different kind of study.

It will be understood, therefore, that when I write "new species" (or *species nova*) I do not use the term in its old formal final sense; I am thinking of a congeries of plants so harmonious within itself and so distinct from all others as to require name and diagnosis if we are to discuss the subject intelligently; and I regret that modern practice has not given us a word of clearer accuracy and significance.

One hindrance to the study of North American Rubi has been the lack (until 1913) of a systematic treatment or schema of the species as a whole, and in consequence species have been described without much reference to each other or to their place in a taxonomic system; the comparative element has been lost. This is true of the devoted work of Blanchard (Fig. 62) who never gave us a round-up or classification of the species even of his region. Lacking such monographic study, he has left us descriptions rather than diagnoses, and without access to his specimens we find it very difficult to understand his species. Moreover, he did not set aside type specimens but at most mentioned type localities and these localities might be several. This accounts for the omission, in this Enumeration, of citations of type specimens for the Blanchard species.

Subsequently to Blanchard's active descriptive work, Rydberg published his extended treatment (Part 5 of Vol. 22 of the North American Flora, 1913), which is the only separate monograph of North American Rubi; this gave us a systematic basis and assembled the citations to literature. The territory of the North American Flora extends to Mexico, Central America, Republic of Panama, and the West Indies proper, so that we have in the Rydberg work a comprehensive and invaluable contribution.

In 1914 the last part of W. O. Focke's Species Ruborum was published, the first part having appeared in 1910 (Bibliotheca Botanica). In this world monograph the North American Rubi are included with the others. Dr. Focke died September 29th, 1922, in his 89th year.

The present brief paper is the third attempt, in modern time, to bring together all our species, but it considers only the Eubati and the territory does not extend south of the United States, nor is it the purpose to diagnose the species other than the new ones. The intervening years have brought together much new material, so that a new study is needed. My purpose in this paper is simply a tentative Enumeration or sequence, not a monograph. It includes several new species but these have arisen only as incidents or units in a systematic analysis and always it has been the first effort to fit the novelties into recognized species. I have omitted several species, and also one new section or group, that I have named and characterized; this is a delay for more material. When we begin to collect our Rubi seriously we shall no doubt discover other species. I have wanted to present such a limited syllabus, even if yet inconclusive, before collectors are tempted to describe further species without adequate regard to their place in a synopsis.

This publication is a sequence to my paper on "Certain Cultivated Rubi" (Gent. Herb. IV, 1923), in which I tried to account for the pomological varieties; I have now been able to suggest a more complete identification of these varieties in the Eubatus subgenus.

The immediate basis of this paper is a considerable extent of field work and an herbarium collection. I have collected Rubus the length of Florida and in much of the intermediate country as far as Mt. Mansfield in northern Vermont. I have visited all the places from which Blanchard obtained the types of his Vermont and New Hampshire species, some of which places in the remote mountain parts are now overgrown and difficult of access. My herbarium contains more than 5000 mounted sheets of Rubus. I have had the privilege of other collections, some of which had been consulted in the preparation of my previous paper as acknowledged on page 141 (Gent. Herb. Fasc. IV). In the present study I have again consulted the collections at the Gray Herbarium, New York Botanical Garden, and the National Herbarium at Washington and have had the loan of specimens from the University of Vermont, Museum of Natural History of Springfield, Mass., from the Milwaukee Public Museum, and the California Academy of Sciences, San Francisco. I have been fortunate to have the aid of Experiment Stations, as the New York (Geneva), Ohio (Wooster), North Carolina (Raleigh), Georgia (Experiment), as well as the cooperation of nurserymen, particularly Reasoner Brothers, Oneco, Florida; H. H. Hume at Glen St. Mary, Florida; H. A. Hyde Co.,

Watsonville, California; M. J. Moniz, Sebastopol, California. Incorporated in this review are studies of specimens specially collected for me by many persons, as Walter Deane, Cambridge, Mass.; S. N. F. Sanford, Boston; J. Franklin Collins, Providence, R. I.; C. A. Weatherby, East Hartford, Conn.; W. B. Rossberg, New Britain, Conn.; George H. Bartlett, North Guilford, Conn.; George Wm. Bassett, Philadelphia; Professor C. F. Williams, Raleigh, N. Car.; R. W. Howell, Terra Ceia, N. Car.; Professor K. C. Davis, Nashville, Tenn.; E. H. Talbert, Clemson College, S. Car.; Miss Irene Stuckey, Experiment, Georgia; Professor J. H. Miller, Athens, Georgia; David Bissett, U. S. Bamboo Gardens, Savannah, Ga.; R. M. Harper, Tallahassee, Florida; Professor W. A. Gardner, Auburn, Ala.; Professor C. B. Wiggans, College Station, Texas; Professor Charles O. Chambers, Stillwater, Okla.; B. F. Bush, Courtney, Mo.; R. I. Cratty, Ames, Iowa; A. M. Fuller, Milwaukee, Wis.; Prof. A. H. Hendrickson, Mountain View, Calif.; C. F. Newcombe, J. K. Henry, George Fraser, British Columbia. I have also had the cooperation of George M. Darrow and the U. S. Horticultural Field Station at Bell, Maryland.

This Enumeration accounts for all the names applied to the North American Eubati (north of Mexico), so far as I know, excepting only *Rubus angulatus* and *R. nitidus*, Raf. Fl. Ludov. 98 (1817), which are binomials applied to the vague descriptions of Robin and are unintelligible; and *R. inermis*, Willd., which I have disposed of elsewhere (the European *R. ulmifolius* var. *inermis*, Gent. Herb. 197). It is not to be assumed, however, that I regard this Enumeration with any feeling of finality. It is only a continuation of studies, to which I have given my major energy for the past three years. There are many undetermined specimens in the herbaria; great regions of the United States have not yet been really collected for Rubi; the necessary field studies are yet to be undertaken. We are only beginning the approach to the subject and are not yet ready to talk about solutions.

We need now a good iconography of the North American species, illustrations of sufficient size and skill to stand in the place of representative specimens. This would require a considerable expenditure, but such a work is capable of making a notable contribution to the understanding of this difficult and interesting group.

We need, also, careful regional Rubus studies. The most important of such contributions in this country is Brainerd & Peitersen's "Blackberries of New England—their Classification," comprising Bulletin 217 of the Vermont Agricultural Experiment Station, June, 1920. The systematic part is principally the work of the late Dr. Ezra Brainerd (Dec. 17, 1844-Dec. 8, 1924. Fig. 91), who had "spent a considerable part of his

time for the past 25 years in a critical study of this genus'' and whose contributions will remain among the standard references. This bulletin attempts not only to identify the blackberries of New England but ''to determine as far as possible the origin of these numerous polymorphous forms.''

FIG. 91. DR. EZRA BRAINERD, PHOTOGRAPHED WHEN COLLECTING RUBUS. THE TREES IN THE BACKGROUND HAVE BEEN KILLED BY FIRE.

Incidentally, I think it incumbent on me to take notice of a remark in this bulletin (p. 5) touching the ''harsh treatment'' I am said to have given the blackberries and dewberries. It is stated that in a recent treatment, which refers to the Standard Cyclopedia of Horticulture, Bailey ''puts all our New England blackberries into a species group and coordinates it, by serial numbers, with such European species as *Rubus laciniatus* Willd. and others of equal rank.'' The authors overlooked my textual explanation of the treatment of which they complain; for I explained that in the state of knowledge then existing ''the reader will scarcely expect to find in this account an evaluation of all the species-

names that have been given to American rubi in recent years. This task may be undertaken at another time, but it would be of little avail when considering merely the horticultural forms." It is to be remembered that the Cyclopedia deals with cultivated plants and it is no part of its problem to treat the native blackberries of New England or of any other region. I explained that "in assembling the American cultivated blackberries into one group in the following account and the cultivated dewberries into another, it is not intended to pass on the merits, from the systematic point of view, of any of the several described species; but in the present state of the case, it is impossible to refer all cultivated forms to the species-names now current, nor is it the purpose of the Cyclopedia to describe all wild species. There is no practicable alternative but to group the horticultural forms at least until such time as the subject is cleared up; and this is done under Nos. 60 and 61."

The Question of Hybridity

As in my former Rubus paper (Gent. Herb. IV), I am here concerned "with identification and nomenclature, not necessarily with the biological question of origins." Binomial nomenclature is not a decision on origins. We must not confuse nomenclature with hypotheses of origin, as I tried to point out in my Brassica paper (Gent. Herb. II): "the subject has been obscured by the effort to combine an hypothesis of the origins of the forms with the identification of them." The greatest quest in biology, to be sure, is the determination of origins and phylogeny, but the immediate necessity is clear identification: we must know the objects in nature; disdain of these objects is one of the outstanding deficiencies in current biology.

To say that a plant is *Rubus allegheniensis* × *cuneifolius* is to make an affirmation, not a name; I am not willing to make the affirmation on the evidence of herbarium material alone. On that basis one is in danger of attributing hybrids to regions in which neither of the assumed parents grows. To declare a plant a hybrid does not aid in the identification of it.

It will be understood that I do not take issue with European or American botanists on the broad question of spontaneous hybridity in Rubus, in Brassica, or other genera; nor is this discussion controversial; nor does it imply criticism of any published work. I am not now concerned with hybridity, but with identification and with nomenclature as a requisite to it. We must constantly test new methods and applications, hoping at each step to make the subject clearer. As I cannot disprove hybridity in any of the published nomenclature, I must in fairness cite the records insofar as they apply to American Eubati: the student will

then have the problem before him. Before entering on the Enumeration, however, I must still further state my point of view. The attentive student will discover that I am really taking issue with my own position of many years ago.

I happen to have 46 herbarium sheets of Rubus representing the progeny of recorded hand crosses; from only one sheet do I obtain a suggestion as to both parents and that even doubtfully; and this is what one would expect from the present knowledge of hybridity (p. 144). Therefore, I have not accepted hybridity, as expressed in double-naming, unless there are records of the fact or unless occurrence and behavior in the field (as in the raspberry *Rubus neglectus*) are such as to raise very strong presumptive evidence. If suspected hybrids are well marked and taxonomically important, they may need binomials for record and identification. We do not know the origin of any of our supposed species of Rubus.

The very unlike conclusions reached by different authors as to the parentage of the same plant are striking illustrations of the inconclusiveness of the practice of determining hybridity from appearances and superficial characters.

Evidence of hybridity in the wild must rest on more complete and exact evidence than we yet possess. Undoubtedly there is spontaneous hybridization in Rubus; how far it extends is not yet to be stated. Any adequate study of subjects connected with hybridity in any genus must be preceded by careful investigation in identities so that the student may know not only what he has to start with but also acquire a view of the nature of the variation within the group; and good herbarium materials should be preserved. Assumption of hybridity carries with it the other assumption that we are confident of the present species of Rubus, but in fact we do not yet know them in North America. Observation in the field often gives the student a fair judgment on the problem, and yet I am more in doubt about field hybrids than I was 30 years ago. It is probably not without significance that Blanchard, primarily a field man and working in the days of assumed hybridity, did not adopt double-naming to account for his novelties.

I am not convinced that the growing of artificial hybrids between assumed parents of wild forms will enable us, in many or even most cases, to check up on parentage of such forms with much certainty, and for two reasons: the hybridizer does not know whether the parents he happens to choose are of pure-line descent or have old inheritances hidden in them that may reappear in seedlings; the progeny is likely to be grown under conditions radically unlike those in which the plants are usually found. A surer way of arriving at judgments of probable parentage is to grow great numbers of seedlings of the suspected hybrids, to observe how they

"break up;" but even then one must be certain that the flowers from which the seed is taken are not themselves cross-pollinated. Many years ago I made and grew hybrids in Rubus. And it is to be further stated that even when the progeny is reared, conclusions can be safely drawn only by a person specially skilled in the diagnosis of Rubus.

Probably the study of the numbers and characteristics of chromosomes is capable of modifying opinions as to the validity of the species, but it must be based on critical identification of the plants and the preservation of ample herbarium material for verification and record. The occurrence of sterile or imperfect pollen is not a sufficient evidence, to my mind, of hybridity.

If these attitudes are well based, then it follows that we must give up the easy practice of recording forms as hybrids, in many critical genera, merely because they are different or supposedly intermediate or of unknown origin. This applies particularly to much of the horticultural literature. As to Rubus, when we come to study it more critically we find many more native species than we thought to be in our flora, and some of the supposed hybrids are referable directly to them. It is frequently assumed that if a peculiar form is known in only one collection it would better be considered a hybrid rather than a species; but lack of knowledge is no better evidence for the one assumption than for the other; subsequent exploration may discover it in widely distant places, and this has been the case with some of the assumed hybrids of Rubus.

It is a common assumption that a strange piece of Rubus growing naturally in a patch of a well-known species is a hybrid; but there is no reason why two perfectly distinct species may not be inhabitants of the same bit of ground,—it is not more strange in Rubus than in other plants.

It is probable that we have now passed the epoch of the effort to account for the forms of plants by assuming hybridity on the evidence of superficial likenesses or intermediateness (see Gent. Herb. p. 144). We must look for more fundamental evidences, and give up the idea that this form or that shows an "influence" or "infusion" of this or that parent because it does not conform to our conception of what the species should be. We are first to clarify our ideas as to species-types and to understand that these types may not coincide with phylogenetic lines: with these types clearly in mind, we shall be able objectively to arrange the variations in reference to them. These types are such as the founders of species have taken for the starting-points of nomenclature; they are definite, whenever the specimens still exist, and are to be substituted for whatever hazy notion a person may have in his head as to what is or ought to be "typical" of the species.

If we wait in the expectation of finding perfectly clear and definite constant differences between what, for purposes of nomenclature, we call species, we shall not understand Rubus.

THE ENUMERATION

With acceptance of the point of view in the preceding pages we are now ready to approach the Enumeration of the kinds of blackberries and dewberries known or supposed to be native in North America north of Mexico. The starting-point in all species is the type specimen whenever it is extant: photographs of all the historic types (so far as they are known) are in my herbarium. If a type specimen does not exist, effort is made to understand just what the original author had in mind as indicated by his description, locality and citations.

We must understand, in all nomenclatorial work, however, that the first systematic botanists did not work on the type-specimen basis: this is a relatively modern idea, made necessary by the greater precision required in these times. Therefore we are not to expect the same definiteness in the concepts of the older species that we demand in the modern. We are now projecting the type-basis idea back into Linnæus, for example; this may be desirable, but we must not suppose that we are thereby correctly interpreting Linnæus when we are only interpreting ourselves. It has recently been pointed out that Linnæus dealt with "concept" genera and species, that his citation of species does not necessarily define what he meant by his genus, and that, in the interest of conservation of difficulties, we would better accept "concept genera" and "standard species" rather than "type species;" probably in most cases the "type" and the "standard" would be the same. This practice would be justified by the fact that nomenclature is a living language for the use of this and succeeding generations and not a system of "credits" to those who long ago passed away, who worked on different bases, and who had their credit in their day. The problem is not to make a uniform conformation to a set of rules, no matter how perfect and consistent the codification may be, as if rules were more important than nomenclature. In the nature of the subject, a living nomenclature cannot be invariable. However,

FIG. 92. PEDICELS DIVARICATE AND CLUSTER RACEMIFORM.

all this does not specially involve the issue of the record of American Rubus, which we are now to examine.

Before proceeding with the keys we may pause to explain the character of inflorescence. In the Eubati it is determinate, the terminal blossom opening first; the mode of anthesis is essentially cymose. But since the flower-clusters may resemble racemes or corymbs, they are habitually so called; in this paper, however, these clusters are spoken of as racemiform and corymbiform. The critical reader understands that the word "inflorescence" when strictly used implies mode of flower-bearing or anthotaxy, but it is commonly employed to designate the flower-cluster itself; in most writings, the context determines the significance.

FIG. 93. PEDICELS ASCENDATE.

In the description of Rubus, the direction of the pedicels is important as a large key character. We may distinguish two forms as shown in the diagrams: *divaricate* (Fig. 92) when the pedicels stand widely spread or nearly at right angles to the rachis, and such clusters are usually distinctly racemiform; *ascendate* (Fig. 93) when they have a strong upward direction, and in these cases the flowers are few, the lower ones usually remote and long-pedicelled.

The unrecorded references in the succeeding pages are to Eugene P. Bicknell, "Have we enough New England blackberries?" Bulletin of the Torrey Botanical Club, xxxvii (1910); Per Axel Rydberg, Rubus in North American Flora, vol. 22, pt. 5 (1913); Ezra Brainerd and A. K. Peitersen, "Blackberries of New England—their Classification," Bulletin 217, Vermont Agricultural Experiment Station (1920); also Bicknell in Bull. Torr. Bot. Club, xxxviii, 103-133.

As in previous issues of Gent. Herb., so here a dagger (†) is placed against new species, new varieties, and new combinations of names as a convenience to the bibliographer.

SCHEMA

Plant truly stoloniferous, the canes trailing or creeping and rooting at nodes or tip or both: pedicels for the most part of the ascendate type: dewberries.

Canes pruinose: Pacific side. . . . . 1. URSINI

Canes not pruinose: Atlantic and eastern.

The prickly dewberries, bearing more or less eatable fruit and yielding pomological varieties: bristles sometimes present with the more or less hooked prickles.

Dewberries of the evergreen kind, some or all the leaves more or less persistent: turion leaflets typically narrow, mostly distinctly longer than broad: canes often bristly: southern. 2. TRIVIALES

Dewberries of the deciduous kind: leaflets of the turions prevailingly broad and large: not bristly: northern and southern. . . . . 3. FLAGELLARES

The hispid dewberries, not known as edible-fruited species: prickles, if any, minor and weak (to which there are certain exceptions): leaflets mostly short, prevailingly pergamentaceous, often shining and more or less persistent. . . . . 4. HISPIDI

Plant not stoloniferous, or only imperfectly and exceptionally (not habitually) so, not trailing; canes erect or recurving, sometimes rooting at tip: pedicels various: blackberries: Atlantic and eastern as far as now known.

The hispid or setose blackberries, the prickles none or few and then not prominently hooked or broad-based as a rule: mostly of low stature, often diffuse, not yielding pomological varieties (In Group 6 the setæ are sometimes confined to the flower-cluster).

Under surface of leaves glabrous and hard to the finger, not velvety, not pubescent except sometimes on the veins: leaves more or less glossy above, with prominent side-veins and a somewhat plicate appearance, usually irregularly serrate or dentate and for the most part not tapering-acuminate; inflorescence short and open, often corymbiform: northern. . . . . 5. SETOSI

Under surface of leaves (at least of the early season) soft or velvety to the finger, mostly dull above and without elevated side-veins or a plicate appearance: leaves mostly rather evenly serrate and on the turions tapering-acuminate: inflorescence usually short-racemiform: northern. . . . . 6. ABBREVIANTES

The non-hispid blackberries, mostly of taller or of stiffer growth, the prickles (except in Group 11) usually large and strong: source of the American pomological blackberries.

Foliage white-tomentose or gray beneath: plants mostly of stiff erect branching habit: northern and southern. . . . 7. CUNEIFOLII

Foliage not white-tomentose underneath or conspicuously cinereus (except perhaps in one of Group 8).

Canes prevailingly strongly armed: plants characteristically with pubescent parts.

Flower-cluster short, more or less leafy or covered in the foliage or at least little projecting beyond it: eglandular or nearly so.

Cluster itself prominently leafy so that it is more or less buried in its own foliage: flowers typically large and showy: pedicels often ascending or nearly so, usually not divaricate: leaflets broad for the most part: northern and southern. . . . . 8. FLORIDI

Cluster itself standing clear of its own floral leaves which (or at least the large ones) are only at the base: flowers mostly small or medium: pedicels

usually divaricate and the cluster short-racemiform: leaflets for the greater part rather long and narrow: northern and southern. . . . . 9. ARGUTI

Flower-cluster elongated-racemiform, typically many-flowered, with strongly divaricate pedicels: new growths, petioles, clusters prominently glandular-hairy: turion leaflets broad, long-petioluled, strongly acuminate or caudate, soft-pubescent underneath, these features serving to distinguish non-characteristic forms that have shorter inflorescence: northern, southward in the mountains. 10. ALLEGHENIENSES

Canes and petioles either unarmed or the prickles few, weak and scattered: parts glandless, glabrous or only lightly pubescent: northern, with southward extensions; includes the "thornless blackberries." . . . . . 11. CANADENSES

Exhibit of Schema

I. *Ursini*; page 217
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2. vitifolius
3. macropetalus
4. loganobaccus
5. titanus
espinatus

II. *Triviales*; page 225
6. trivialis
7. mississippianus
8. continentalis
9. rubrisetus
10. okeechobeus
11. ictus
12. mirus

III. *Flagellares*; page 232
13. flagellaris
roribaccus
geophilus
invisus
michiganensis
14. arizonensis
15. nefrens
16. Baileyanus
17. rhodinsularis
18. Enslenii
19. velox
20. immanis
21. plicatifolius
22. arenicola
23. Boyntoni
24. biformispinus

IV. *Hispidi*; page 248
25. hispidus
26. cubitans
27. vigil
28. jacens
Blanchardianus
specialis
29. trifrons
30. arcuans
31. tardatus
32. permixtus

V. *Setosi*; page 254
33. setosus
34. junceus
35. vermontanus
viridifolius
36. semisetosus
37. miscix
38. ascendens

VI. *Abbreviantes*; page 259
39. abbrevians
40. montpelierensis
41. glandicaulis
neoscoticus
42. frondisentis
43. flavinanus
44. fraternalis

VII. *Cuneifolii*; page 262
45. cuneifolius
angustior
46. inferior
47. probabilis

VIII. *Floridi*; page 265
48. floridus
49. rosarius
50. rhodophyllus
51. betulifolius
52. frondosus
53. ucetanus
54. amnicola
55. recurvans
56. Rossbergianus
57. recurvicaulis
inarmatus
armatus
58. semierectus
59. multispinus
60. Brainerdi

IX. *Arguti*; page 276
61. argutus
scissus
62. ostryifolius
63. persistens
64. crux
65. pergratus
66. floricomus
67. Andrewsianus
68. lucidus
69. tallahasseanus

X. *Alleghenienses*; page 287
70. allegheniensis
albinus
calycosus
Gravesii
71. alumnus

XI. *Canadenses*; page 292
72. canadensis
septemfoliolatus
73. amicalis
74. elegantulus
75. Randii
76. multiformis
delicatior
77. ithacanus

I. URSINI *(Vitifolii)*

Canes more or less pruinose: stems often ascending a few feet and then becoming long trailing canes: flowers for the most part unisexual: fruit of many compacted drupelets: far western species, rooting at the tips of canes.

Here we have the most baffling present problem in North American Eubati, mostly because adequate specimens and field notes are lacking. By choosing my specimens I can make a dozen species in the group from present material and be able to defend them; but the difficulty comes when I receive fifty other specimens and perhaps cannot tell to which of the dozen they belong. It is only when one has ample flowering and turion shoots positively *from the same plant at the same time*, together with notes on habit, that one can approach the problem with confidence. The variations in the Ursini appear to be protean. Therefore they must be largely passed over for the present.

A. Flowers prevailingly unisexual or one sex little developed (plants subdiœcious): fruit characteristically black and sweet, usually under 1 inch long, pilose or glabrous: indigens. (Now and then one finds flowers with stamens and pistils both well developed).
  B. Plant with prickles long, weak and mostly crowded and usually straight or only curved, with smaller ones between: leaves broad (mostly on the ovate order or broader), grayish or tomentose beneath, the teeth relatively small and not usually attenuate; pedicel and calyx mostly glandless.
    C. Shoots and young parts tomentose: middle leaves on flowering shoots 3-foliolate. . . . . *1. R. ursinus*
    CC. Shoots and growing parts pubescent or glabrescent: middle leaves on flowering shoots 3-lobed and more or less vitis-like. *2. R. vitifolius*
  BB. Plant not tomentose, with prickles short, rather scattered and mostly hooked: leaves thin and greenish both surfaces, relatively narrow or at least attentuate-pointed and irregularly sharply toothed; pedicel and calyx bearing many prominent stalked glands. *3. R. macropetalus*

AA. Flowers bisexual and apparently functionally perfect even though sometimes self-sterile: fruit usually above 1 inch long, often very long: plants of enormous growth and vine-like canes: cultigens.
  B. Leaves very broad, white-tomentose or gray-pubescent beneath: fruit red, acid, pilose. . . . . *4. R. loganobaccus*
  BB. Leaves ovate-attentuate, only thinly pubescent beneath: fruit black, sweet, glabrous or nearly so. . . . . *5. R. titanus*

1. Rubus ursinus, Cham. & Schlecht, Linnaea, ii, 11 (1827).

Type locality, "in dumetis ad sinum St. Francisci Californiæ novæ una cum R. vitifolio legimus." Type specimen in Botanisches Museum, Berlin-Dahlem, Fig. 94. The specimen identifies this species as the tomentose form of the dewberry or blackberry of California and parts of Oregon. The 3-foliolate leaves midway and below on the flowering shoots is not a constant or reliable character although stressed in the original description.

I suppose the California non-glandular blackberry to be one species; if so I should apply the name *R. ursinus* because we have a type specimen and can identify it; and *R. vitifolius* has no claim to supplant it except only that it happens to be printed on page 10 of Linnaea rather than on page 11. The leaf forms are surprisingly diverse in these blackberries, and often one finds them on the same specimen if it is large enough to represent the plant.

I have not seen pomological varieties representing this species, although it is supposed that the Aughinbaugh, once somewhat grown in California, belongs here.

2. **Rubus vitifolius**, Cham. & Schlecht, l.c. 10.

Type locality "ad San Francisco Californiæ reperimus." Type specimen unknown. I have never seen a plant to which I feel safe in applying the original diagnosis of *Rubus vitifolius*. Therefore the key characters are taken from the diagnosis. The absence of any reference to glandulosity apparently eliminates *R. macropetalus* as a possibility. The authors had a piece of a terminal flowering shoot eight inches long: "specimen possidemus unicum, rami scilicet floriferi partem superiorem, apicalem, octopollicarem." We must look for a plant to which the name *vitifolius* (vitis-leaved) applies and which is only "puberulis" and the leaves "glabrescentibus."

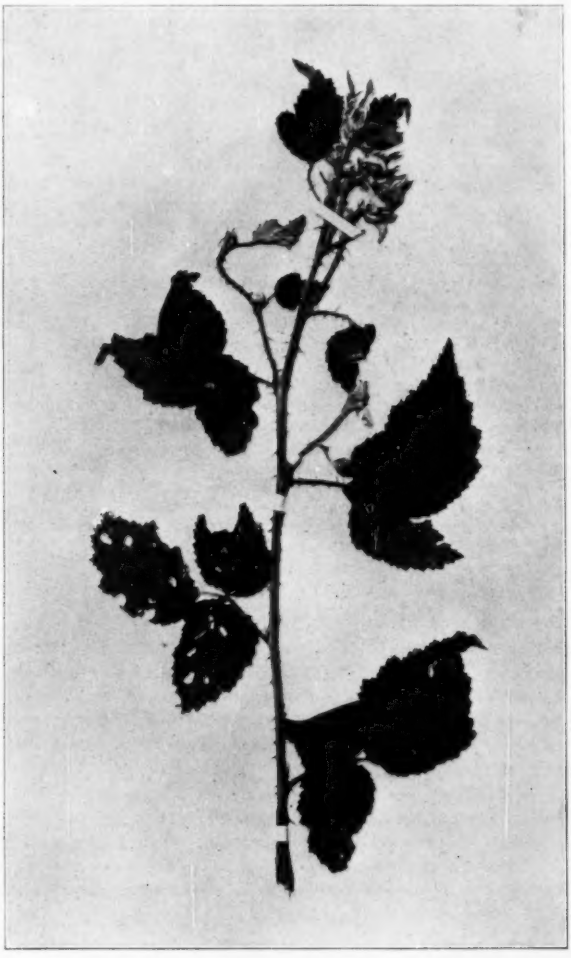

FIG. 94. *Rubus ursinus*, THE TYPE SPECIMEN IN BERLIN-DAHLEM

Fig. 95 shows approximately such a plant, from Fresno County, California. I have seen similar specimens from San Francisco, the original locality. If the upper eight inches of this specimen were taken, the leaves would be "trilobis" and more or less vitis-like; but the specimen is too pubescent to meet the diagnosis, and such seems to be the case with all similar specimens I have seen. All I can do at present is to associate with the name *R. vitifolius* all the specimens that mostly have 3-lobed leaves on the flowering shoots, are pubescent rather than tomentose, and that are usually not glandular. From this range of forms I am not able to separate *R. Eastwoodianus*, Rydb. N. Amer. Fl. xxii, 460 (1913). Whether *R. vitifolius* is a "good species" I have no means of knowing.

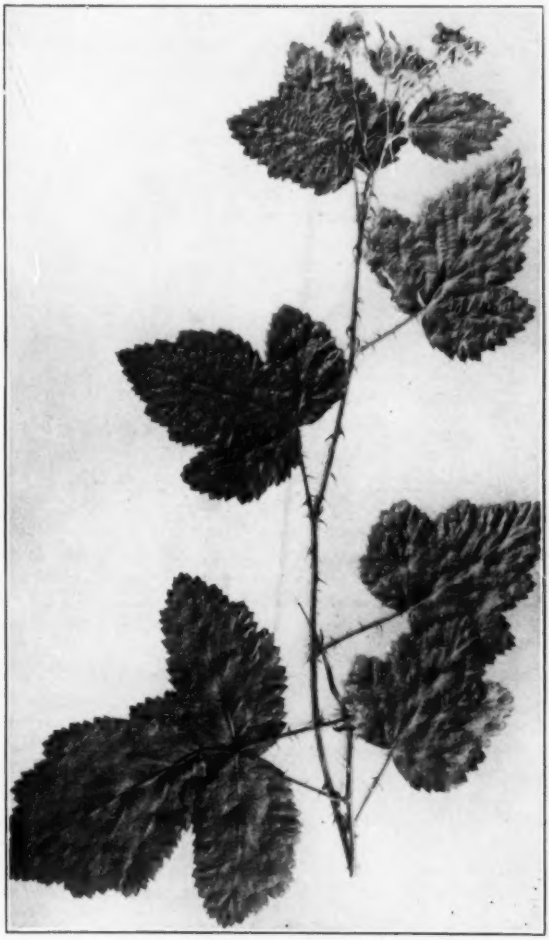

FIG. 95. SUPPOSED *Rubus vitifolius*.

It is to be noted that although *R. vitifolius* and *R. ursinus* were collected at the same time (of *ursinus* it is said, "In dumetis ad sinum St. Francisci Californiæ novæ una cum R. vitifolio legimus") and were also described at the same time by the same authors, yet they are neither compared nor contrasted with one another. Of *ursinus* it is written, "An R. fruticoso, an potius R. idæo affinis?" and of *vitifolius*, "R. trilobo Sér (*in DC. prodr. p. 566*), nobis ignoto, proxime videtur esse affinis," with a recital of the differences between them. The two new species must have looked to the authors to be very unlike. The comparison of *R. vitifolius* with the Mexican *R. trilobus* is surprising, for that plant is not associated with the Eubati in DeCandolle. *R. trilobus* is founded on a drawing,

"(Mex. ined. icon.)" This drawing to which DeCandolle referred was one of the lot of Icones by Sesse and Moçino; a copy of the Rubus drawing is now in the De-Candolle Herbarium in possession of the City of Geneva. Through the courtesy of Mons. R. Chodat I have a photograph of this excellent illustration. The description and the photograph of *R. trilobus* in Focke's Species Ruborum (Bibl. Bot. heft 72II, 126 fig. 55) agree well with the drawing; it is the *Oreobatus trilobus* Rydb. N. Amer. Fl. xxii, 428. There is no Rubus of this kind known in the San Francisco flora; and *R. spectabilis* is ruled out of possible consideration by the diagnosis of *vitifolius*.

A diagnosis of the apparently essential points of *R. vitifolius* may be assembled from the original description: stems aculeate-pruinose, puberulent, the peduncles, calices, petioles, nerves and veins of the leaf aculeate; prickles about 2 lines long, slender, little dilated at base, straightish or somewhat recurved, crowded toward the ends of the branches so that the peduncles and calices are much armed, the lower prickles broader and larger and uncinate-retrorse: lvs. 3-lobed, unequally serrate, glabrescent, cordate at base with an acute sinus, 3 in. long, the lateral lobes shorter and divergent and acute but scarcely acuminate, the middle lobe gradually long-acuminate, the serratures double, large, somewhat cuspidate-acuminate; stipules setaceous, hairy: fls. terminal, subcorymbose; calyx-lobes ½ in. long, lanceolate with long-acuminate linear somewhat dilated subfoliaceous tip, longer than the obovate petals; pistil villous.

3. Rubus macropetalus, Dougl. apud Hook. Fl. Bor.-Am. i, 178, t. lix (1832).

R. Helleri, Rydb. N. Amer. Fl. xxii, 460 (1913).

Type locality "banks of rivers and in low woods, in the Valley of the Columbia, North-West America." The original illustration (Fig. 96) identifies the plant.

When we shall have assembled proper specimens and studied the ranges, we shall probably find this to be a clear species. I have examined material from British Columbia, Idaho, Washington, Oregon, and the highlands of California. How far down it may go in California is to be determined by subsequent explorations and careful collecting; I have seen material I now take to be this species from Del Norte, Siskiyou, Humboldt, Trinity, Shasta, Plumas, Mendocino, Lake and Amador (2000 feet) counties; and pieces that may be the same come from Sonoma, Napa, Marin and Mariposa counties.

Rubus macropetalus is a variable plant, but usually looks different from *R. ursinus*. The plant thrives in burnt-over areas and along woods roads, often becoming a troublesome weed in gardens for its long deep vertical root is difficult to eradicate and it roots at the tip. The young growing canes are glaucous; armature variable. The leafage is variable, yet all the foliage of turions I have seen agrees in general in the thin texture and attenuate sharp apex. Fig. 96 shows the characteristic form. Douglas (in Hook. l. c.) mentions one form with "foliolis acutis" and another with "foliolis obtusis;" this difference I have observed often in foliage of bearing canes; turion leaflets are three or five; the leafage often turns crimson and purple in winter. The flowers are diverse, as staminate, pistillate, staminate with fairly developed but apparently abortive carpels; the size of flowers is variable, the staminate usually being larger; petals vary from 5 to 20 mm. long, and differ remarkably in shape; sometime a careful observer will correlate these differences and find out what they mean. The fruit is sometimes 25 mm. long and half as broad, but usually much smaller, either oblong or ovoid, mostly glabrous but sometimes sparingly pilose.

This species has been represented in cultivation by the named pomological varieties Belle of Washington, Humboldt, Skagit Chief, Washington Climbing, Gazadero.

Whatever stock I have seen in parks and experiment grounds in the East as *R. ursinus* is *R. macropetalus*.

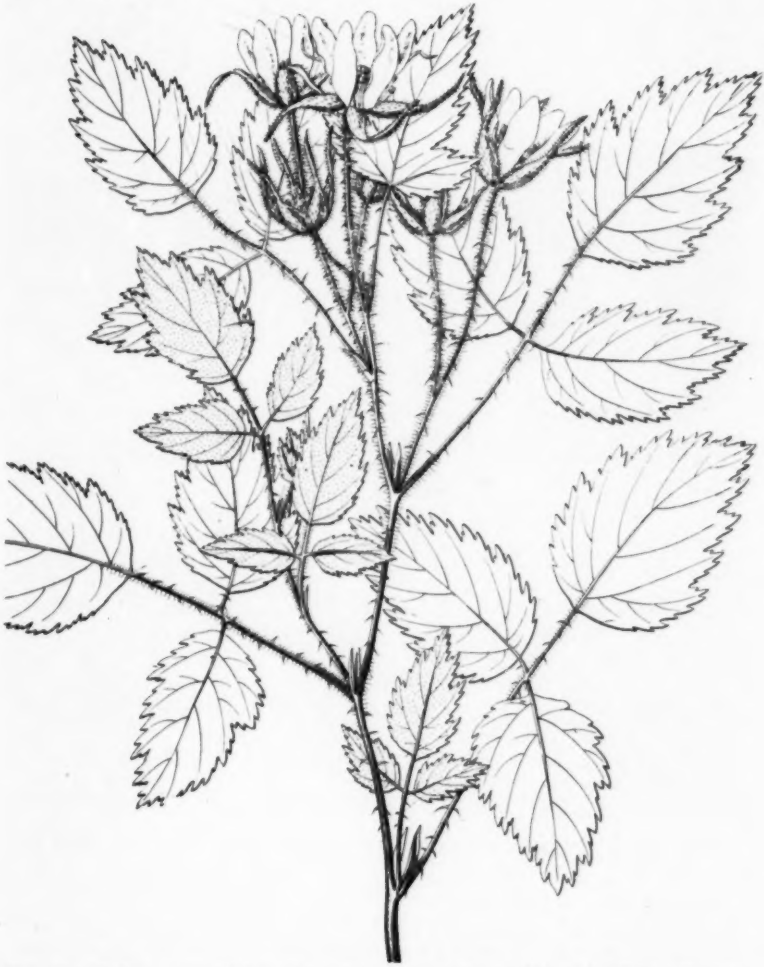

FIG. 96. *Rubus macropetalus*, AS ORIGINALLY FIGURED IN HOOKER'S FLORA BOREALI-AMERICANA, SOMEWHAT REDUCED.

4. **Rubus loganobaccus**, Bailey, Gent. Herb. 155 (1923).

Loganberry, Phenomenal, cultigens (for origins, see Gent. Herb. l. c.), representing the broad-leaved tomentose kind of plants to which I apply the name *R. ursinus;* recorded as a hybrid between *R. ursinus* and a red-raspberry, but by many persons regarded as more likely a mutant from *R. ursinus*. Its systematic status cannot be de-

termined until the wild Rubi of California are understood. It produces stout canes many feet long, not much if any branched, and bears very broad thick heavy leaves. Fig. 97 shows characteristic armature and foliage of a turion of loganberry. The loganberry bears freely of large pinnately 5-foliolate leaves. At the time I wrote my former paper I had not seen such leaves on wild *R. ursinus* but I now have specimens that show them to some extent. On page 155 I speak of a plant from Madera County with 5-foliate leaves but pedate; that plant turns out to be a new and undescribed

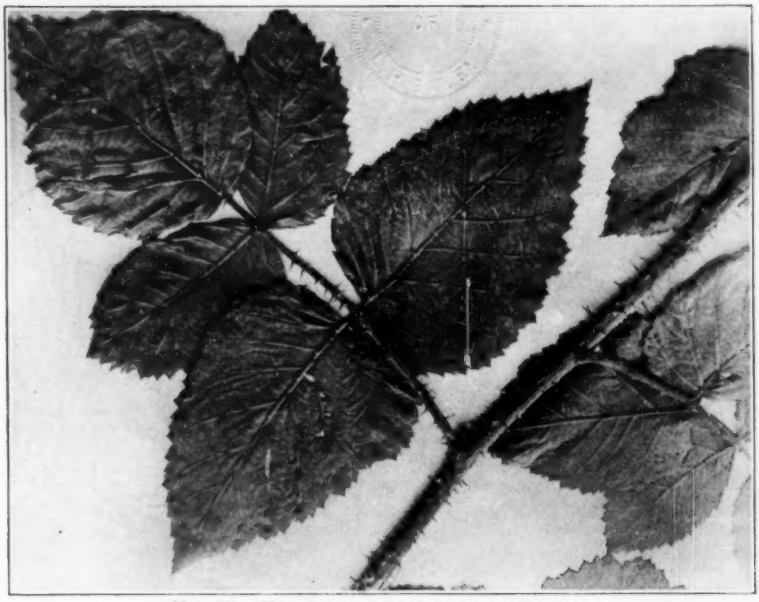

FIG. 97. FIVE-FOLIOLATE LEAF OF LOGANBERRY. —*Rubus loganobaccus.*

species, so that it is removed from the present discussion; I await further material of it.

Under favorable conditions the Phenomenal bears a larger and milder fruit than the loganberry.

† 5. **Rubus titanus**, cultg. vel spec. nov.

Planta maxima et robustissima, caulibus 6-12 m. longis, repentibus vel vitium similibus, acutis, aculeis basi dilatatis dense armatis circa 8 mm. longis: turionum foliola 3 vel 5, ovata et acuminata, 10 cm. longa vel ultra, subtus pubescentia, prominenter dentata, petiolis et mediis costis validis aculeis armatis; ramorum floriferorum foliola similia sed minora, minus aculeosa plerumque pubescentiora: inflorescentia foliosa, longior, pedicelli inferiores remoti, partes pilosae sed eglandulosæ; flores 2½ cm. diam. vel ultra: fructus ater, oblongus, saepe 5-6 cm. longus. Var. **espinatus**, planta aculeis sat destituta.

A titanic grower, producing heavy thick vine-like canes 20-40 feet long: canes finely pilose, cylindrical or the vigorous ends somewhat angled, thickly set with straight stiff broad-based sharp prickles of different lengths, the largest 7-8 mm. long: leaves

of turions 3- or 5-foliolate, strongly petioled and the terminal leaflet prominently stalked, the petioles, petiolules and midribs bearing many short sharp stout flat-based prickles, glabrous above or becoming so, pubescent beneath; leaflets ovate, acuminate, 4 inches or more long, margins coarsely jagged-dentate, sometimes obscurely lobed: leaves of flowering shoots similar but smaller, less prickly and usually more pubescent: inflorescence cymose or determinate, leafy, making a cluster several inches long and straggling below, calices, pedicels and peduncles pilose-pubescent and not glandular: flowers bisexual although needing cross-pollination, 1 inch or more across, calyx-lobes broad-ovate, mostly cuspidate, much shorter than the petals: fruit black, long-oblong, often 2-2½ inches long, sweet and delicious. Fig. 98 shows the turion foliage and the characteristic armature. Var. **espinatus**, cultv. nov. Plant nearly or quite devoid of prickles. Fig. 99.

FIG. 98. TURION OF *Rubus titanus*.

The Mammoth blackberry, and var. *espinatus* the Cory (Cory Thornless). The history of the Mammoth is recorded in my former paper (Gent. Herb. 156). It originated with Judge Logan, in the garden that produced the loganberry; he supposed it to be a hybrid of *R. ursinus* and Texas Early. I do not know what the Texas Early of that day may have been; the Texas Early or Crandall of present cultivation is a bush blackberry, probably of the *R. frondosus* or *R. recurvans* type; there is also a Texas Everbearing of similar type; the Texas dewberry or Texas Evergreen of California is apparently a form of *R. flagellaris*. The Cory was discovered by Martin Muehli in 1909 as a single cane from a Mammoth blackberry in a plantation in Tuolumne County, California, and was propagated by W. C. Cory.

Judge Logan apparently thought the loganberry and Mammoth closely related, but in botanical characters of cane and foliage they are very different. We may have new light on the standing of *R. titanus* when the Rubi of California are collected.

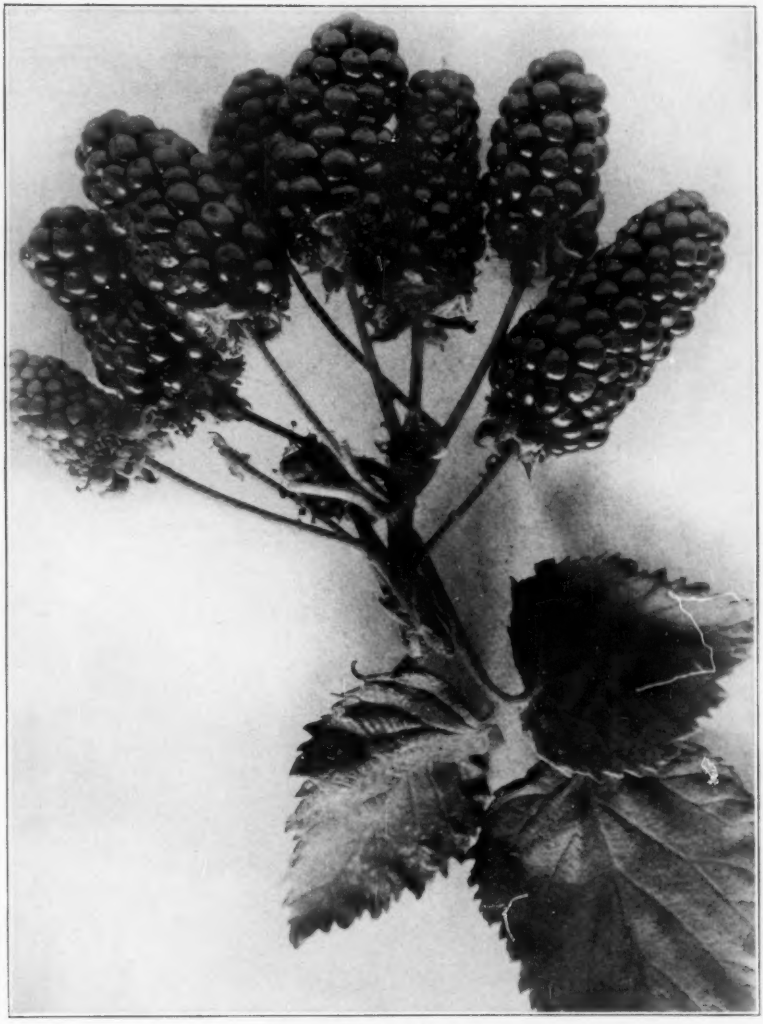

FIG. 99. CORY BLACKBERRY.—*Rubus titanus* VAR. *espinatus*.

II. TRIVIALES

Plants trailing, or prostrate and becoming trailing, usually long-running, rooting at nodes or tips or both: prickles abundant and strong, hooked and broad-based, on both canes and inflorescence, the stems mostly also bristly but sometimes not so: foliage more or less persistent (evergreen): flowers usually on long armed pedicels: southern dewberries.

A. Plant prevailingly bearing bristles or stiff hairs among the prickles (although bristles sometimes may be nearly or quite lacking on certain lengths of the stem and inadequate specimens may therefore be confusing).

B. Flowers all or mostly from spurs or short laterals along the course of the trailing stem, on erect slender peduncles or pedicels: leaflets, particularly on the new growths, of the lanceolate, oblong, oval or narrow-ovate kind; leaflets on flowering shoots small (1½-2 inches or less long).

C. Turion leaflets usually not broader than elliptic, often much narrower, firm and persistent, more or less shining, serrate or closely serrate-dentate: flowers from short lateral spurs.

D. Leaflets of flowering shoots short, obtuse or only short-acute. *6. R. trivialis*

DD. Leaflets of flowering shoots long and narrow, very acuminate. *7. R. mississippianus*

CC. Turion leaflets broader, of the oval or narrow-ovate order, thin and apparently little if at all persistent, strongly simply dentate or even notched: flowers often borne also on elongated leafy shoots. . . . . *8. R. continentalis*

BB. Flowers in small terminal corymbs on short lateral shoots, mostly 5 or 6. . . . . *9. R. rubrisetus*

BBB. Flowers on very long stout peduncles in the upper axils of vigorous cane-like foliose shoots: leaflets on all growths large and broad-ovate, broad at base and often subcordate, usually 2 inches or more long and more than half as broad, margins sharply doubly serrate; upper floral leaves simple and large: robust. *10. R. okeechobeus*

AA. Plant devoid of bristles, bearing only stout broad-based prickles on the bearing canes which are decumbent rather than trailing although rooting at the tip.

B. Prickles on pedicels small and weak, not prominent: flowers small: turion leaflets on the elliptic order and therefore narrow. . *11. R. ictus*

BB. Prickles on pedicels very long and prominent, flat-based: flowers very large (usually more than 1 in. across): turion leaflets on the ovate order and therefore more than half as broad as long. *12. R. mirus*

6. **Rubus trivialis**, Michx. Fl. Bor.-Am. i, 296 (1803).

Type region, "Carolina et Pennsylvania, ubique frequens." Type specimen in Hb. Mus. Paris. Fig. 75, Gent. Herb. The plant is not authoritatively reported north of Virginia notwithstanding the original citation of range; Michaux probably included *R. flagellaris*, as he does not account for any other trailing species of this kind for the southern country; Muhlenberg includes *R. trivialis* under his *procumbens* (Gent. Herb. 159); these circumstances show that differentiations were not close in Rubus in those days.

The southern dewberry trails in sandy and dry areas from Virginia to Florida westward to Texas in the lower altitudes, also in Missouri, Arkansas, and Oklahoma. It is variable within this great range. The turions are eventually root-tipping, but frequently they are first erect.

This dewberry yields a good edible fruit. A number of named forms have been introduced to cultivation, as San Jacinto, apparently all natural variations from the

wild, but how many of them are to be associated with the *R. continentalis* segregate is uncertain. White-fruited variants occur, and two or three of them have been propagated under names.

7. Rubus mississippianus, Bailey, Gent. Herb. 171 (1923).

Type locality, Tchouticabouef Creek, Biloxi, Miss. (Tracy No. 4114). Type specimen in Hb. Bailey., Fig. 76, Gent. Herb.; known only from the original collection.

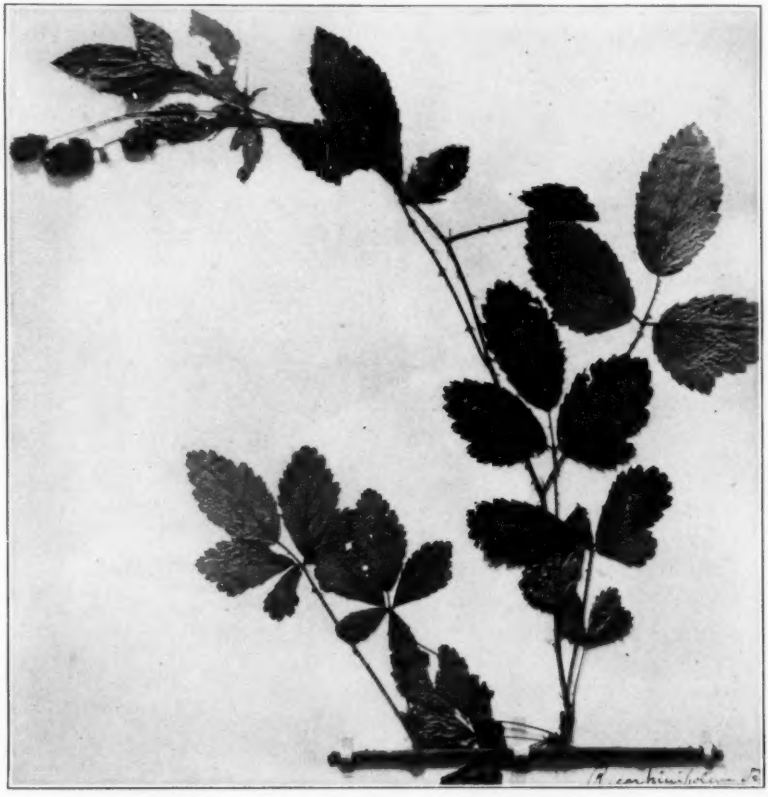

FIG 100. TYPE SPECIMEN OF *Rubus continentalis*.

8. Rubus continentalis, Bailey, Gent. Herb. 173 (1923).

R. carpinifolius, Rydb. in Small, Fl. Southeast. U. S. 519 (1903), non Wh. & N. nec Godr.

R. hispidus subsp. (?) *continentalis*, Focke, Bibl. Bot. heft 83[1], 86 (1914).

Type locality, near Alexandria, Louisiana, Ball 428. Type specimen in N. Y. Bot. Gard. (Fig. 100). Known to me from Baltimore, Md., Raleigh, North Carolina, Cullman Co., Alabama (Blanchard 62 as *R. trivialis*), abundant material from eastern

Texas, one specimen from Brownsville, extreme southern Texas, and a turion from Norman, Cleveland Co., Oklahoma (Blanchard 160 unnamed by him).

It is not without hesitation that I retain the name *R. continentalis*. In doing so I largely disregard the diagnoses and ranges of Rydberg in Small's Flora and in North American Flora and rely on the type specimen, Ball Pl. La. No. 428 (Cf. Small. Flora p. 1331); this specimen is without turion foliage, but it displays the thin leaves and the tendency to bear flowers on the summit of elongated leafy shoots. In Small's Flora Rydberg accredits the plant to "Arkansas and Louisiana," and in the

FIG. 101. CONTRAST OF TURION FOLIAGE OF *Rubus continentalis* (LEFT) AND *R. trivialis* (RIGHT).

North American Flora extends it to "Louisiana and Arkansas to Southern Illinois, Oklahoma and Texas." In the restricted meaning I give the species, as expressed in the key on page 225, these ranges may not apply. The large broad thin simply notch-toothed apparently scarcely persistent turion leaflets, and the tendency to blunt leaflets on the flowering branches, give the plant a distinct appearance; I suspect it is not so prostrate as *R. trivialis*. Proper judgment on the species must await further collections and field notes; it is characterized chiefly by the turion foliage, and such foliage is not often collected (Fig. 101).

The Manatee dewberry, the leading pomological variety of the Triviales, is to be associated with *R. continentalis* (Fig. 102). This is presumably of South Florida origin. It "was introduced by Reasoner Brothers, Manatee, Florida, in 1889." (Bailey, Bull. 34, Cornell Exp. Sta. 1891 p. 309); and Reasoner Brothers add that it "is only a selected strain of the common *Rubus trivialis*."

9. **Rubus rubrisetus**, Rydb. in Britt. Man. 497 (1901).

Type locality, New Orleans, La.; type specimen N. Y. Bot. Gard., a flowering piece. Because the type specimen has short consolidated flower-clusters quite unlike

the single long-pedicelled flowers of the others of this group, I keep it distinct until turions are associated with it and the full character of the plant is understood. In the original description and in the North American Flora Rydberg gives the range as the Mississippi Valley from Missouri to Louisiana; but the dense clothing of red or purplish hairs, from which the plant takes its name, is not designative and the several-flowered short inflorescence, which Rydberg stresses and which the type specimen exhibits, must be taken as the characteristic feature until the plant is more carefully collected.

FIG. 102. MANATEE DEWBERRY.—APPARENTLY A FORM OF *Rubus continentalis*.

Ness states (Bull. 326, Texas Exper. Sta. 11, 1925) that "*Rubus rubrisetus* differs obviously from *R. trivialis*....in producing two forms of shoots; namely, low, spreading, slender, profusely branching shoots; and erect, stout shoots, 4 to 6 feet high with very few or no branches, and more densely covered with long, red bristles than the low shoots."

The nessberry is recorded (l.c. p. 19) as a hybrid derivative from this species and a red raspberry, that is, Brilliant × *R. rubrisetus* F_3.

† **10. Rubus okeechobeus**, spec. nov. Fig. 103.

Species Trivialium, magnitudine plantæ insignis, prostratus, caulibus longe repentibus et radicantibus: folia maxima; foliola late ovata ad oblongo ovata, 5 cm. vel ultra longa, 2½ cm. vel ultra lata, acute dentata; superiora folia juxta flores simplicia magnaque; pedunculi prolongati et valde armati, orti ex superioribus axillis longorum foliosorum ramorum: flores 2½ cm. vel ultra diam., albi: fructus ater, pæne globosus.

A very robust trailer, with young shoots mostly erect and canes becoming prostrate and rooting, forming mats 2 feet high, with stems extending 10-12 feet on the ground, making large deep colonies: canes bearing many strong hooked prickles and abundant bristles: leaflets 3 or 5 on the turions, large, broad-ovate to oblong-ovate, 2 inches or more long, sometimes subcordate, margins sharply double-serrate; upper leaves on the

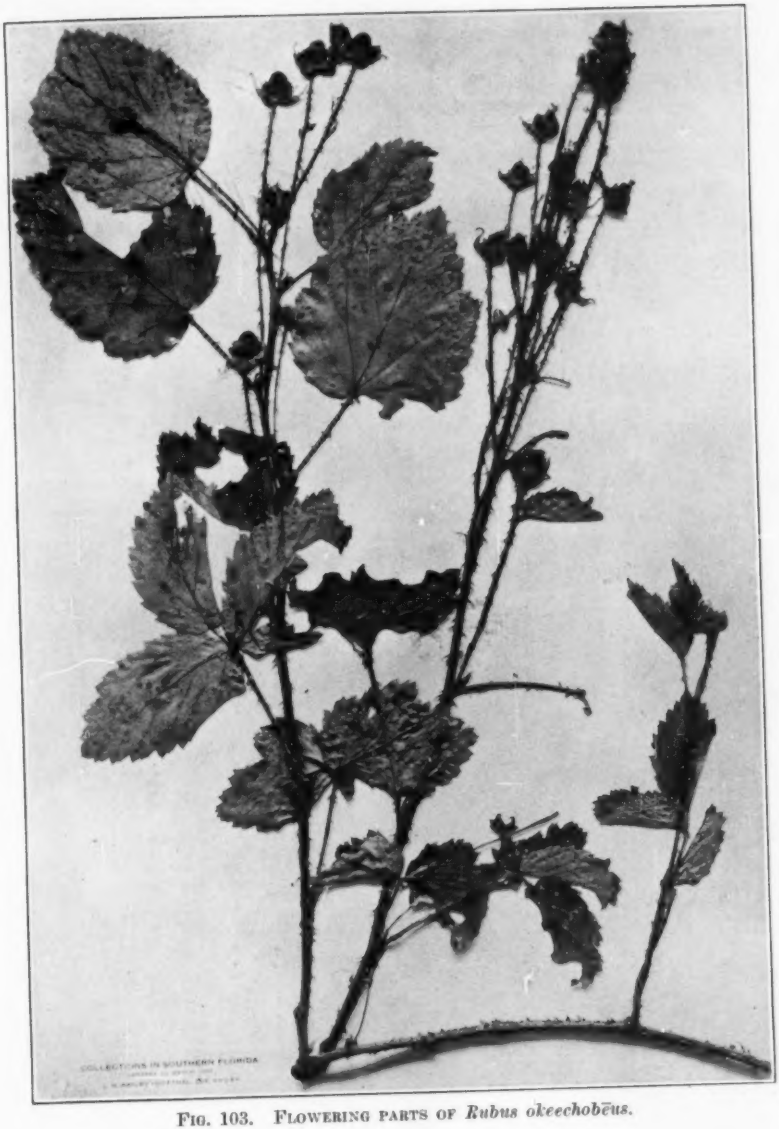

FIG. 103. FLOWERING PARTS OF *Rubus okeechobēus*.

flowering shoots simple, long-stalked, large: flowers 1 inch or more across, white, on stout very long simple or sometimes forking strongly armed peduncles that arise among the leaves toward the summit of vigorous long cane-like shoots; petals broad and obtuse: fruit nearly globular, black.

East shore of Lake Okeechobee, southern Florida, in sunny and half shady places, L. H. and Ethel Zoe Bailey.

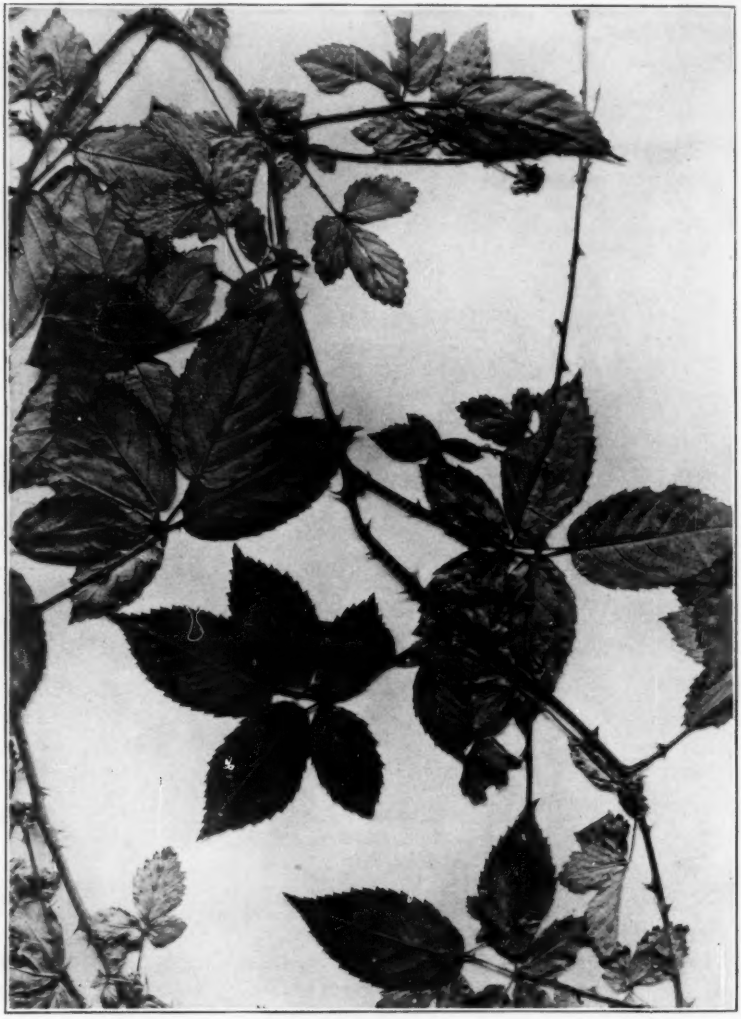

FIG. 104. CHARACTERISTIC FOLIAGE AND HABIT OF *Rubus ictus*.

† **11. Rubus ictus**, spec. nov. Fig. 104.

Planta robusta Trivialium, sed setis destituta nec tota prone repens; turiones valde ascendentes et sulcati; caules fructiferi arcuati vel prostrati vel magis minusve repentes, apice radicantes; aculei acutissimæ, illæ in caulibus fructiferis basi dilatatæ et manifeste uncinatæ: planta fere glabra paucis raris villis in venis subter folia exceptis vel interdum in immaturis turionum partibus molliter pubescens: turionum foliola plerumque 5, elliptico-ovato, 3-5 cm. longa, circa 1½-2½ cm. lata, firma et persistentia, supra lucida, acute dupliciter serrata, petioli validis uncinatisque aculeis muniti: flores 1-4 in armatis sæpe longis pedicellis; corolla alba, circiter 2 cm. lata, petala lata obtusaque: fructus parvus, oblongus.

A strong plant lacking bristles, with ascending turions that are pubescent on the young parts and under surface of leaves but that become nearly or quite glabrous the second year; bearing canes rising 18-24 inches high over grass or underbrush but becoming nearly or quite trailing in open ground, rooting at the tip; prickles 8 or 10 to the inch, broad-based and hooked on older parts but nearly or quite straight on soft turions; petioles and petiolules sharply armed: leaves persistent, the old ones more or less glossy above and glabrous; leaflets elliptic-ovate, 2-3 inches long and half or less as broad, sharply doubly serrate, short-pointed: flowers 1-4 on armed pedicels, white, about ¾ in. across, petals broad and obtuse: fruit small, oblong.

FIG. 105. NORMAL FLOWERING SHOOT OF *Rubus mirus*.

Low but dry place among grass near Savannah, Georgia, Bailey (Fig. 104). Open ground, Tallahassee, Florida, Bailey; Montgomery, Alabama, Blanchard 69 as *R. trivialis*, "a great thing, without bristles, a dewberry but long (15 ft.) and large," and also Blanchard 85 from the same place as *R. trivialis* × *Andrewsianus;* also by Tracy at Agricultural College, Miss., later confused with *R. lucidus*, and at Biloxi, Miss. 9887, as *R. trivialis*. I took this plant nearly 30 years ago near Jacksonville, Fla., but have been unable to resolve it until now.

† **12. Rubus mirus**, spec. vel. cultg. nov. Fig 105.

Species Trivialium affinis *R. icto* a quo differt fere latioribus foliolis subtus pubescentibus in venis, et præsertim majoribus floribus 6 cm. vel ultra diam., in aciculosissimis pedicellis gestis, albis vel subpuniceis: caules fructiferi perlongi, valde armati

aciculis deflexis sed setis glandulisque destituti: foliola fere ovata, 3 vel 5, margine acute dupliciterque serrata, superiora folia juxta flores interdum simplicia: fructus ater, 5 cm. vel ultra longus, 3-4 diam., edulissimus.

FIG. 106. ABNORMAL FLOWERS OF *Rubus mirus*.

The Marvel dewberry, found in a yard near Daytona, Florida, in 1908, and now much cultivated in southern Florida, being trained on trellis or posts. It roots at the tip, but commercial propagation is mostly from root cuttings. The plant is of the *R. ictus* kind in its strong armature and in the entire absence of bristles and glands. The flowers are borne on elongated strongly armed pedicels. The genesis of this horticultural variety is unknown, but it is so remarkably distinct as not to be referable to anything else I know, and it cannot be treated in an Enumeration without a name and place. It has been conjectured to be a cross between *Rubus floridus* and *R. lucidus*, but as neither of these species is a dewberry such reference is at least doubtful. The fruits are black and of excellent quality, one inch or greater in length and three-fourths or more as thick.

The Marvel is much subject to the double-blossom disease, and this probably accounts for the 7 or 8 petals and the crumpled appearance in some of the very large flowers (Fig. 106) and also for the clustered effect of the long pedicels in some cases; the calyx-lobes are frequently greatly extended and foliaceous, due probably to the effect of the fungus; and the flowers are often more than 2 inches across.

III. FLAGELLARES (*Procumbentes*, pro parte).

Deciduous non-setose non-bristly dewberries, being trailing or at least prostrate plants usually freely rooting at the tip of canes: leaflets, particularly on the turions, broad and mostly large (ovate or broader, or cuneate-ovate): prickles mostly not prominently broad based, at least not in the inflorescence (where they are often lacking): inflorescence typically of the ascendate kind but running into diffuse-racemose forms: (nos. 14 and 19 have broad-based prickles on the main canes): northern and southern.—A group of difficult brief definition yet fairly homogeneous. A few of the plants that have been referred to this association I have now placed in the Floridi because of their more elongate divaricate and yet leafy flower-clusters and one of them goes to the Canadenses; some of these may root at the tip, but they are plants with an erect or strongly ascending habit at first and become procumbent in autumn or the second year, and are not trailers. The Flagellares are essentially glandless plants; Nos. 23 and 24 are exceptions, and these may eventually be separated in another Group.

AA. Canes, petioles and pedicels essentially or wholly glandless (sometimes somewhat glandular on calyx): prickles prevailingly uniform or practically so.

B. Inflorescence (when flowers are not solitary) of the ascendate kind, —flowers few (2-5 or 6, only rarely more) in an open leafy ap-

parently forking cluster but not truly dichotomous, formed by successive ascending or erect long pedicels surpassing the previous ones or at least the first and terminal one, the flowers usually not greatly or distinctly surpassing the foliage; commonly 1 or 2 long pedicels lower down on the flowering shoot.

CC. Turions slender, or at least not of exceptional size, and essentially terete: prickles relatively short and small (2-3 mm. long) or even practically wanting: leaves of fruiting shoots prevailingly 3-lobed or 3-foliolate.

D. Plant with stiff woody mostly long-running canes, the turions usually not conspicuously scaly-bracted at base: leaves commonly firm or even coriaceous. No. 16 may be more or less an exception.

E. Some or all the pedicels elongated (2 in. or more) and remote, prominently ascending: lateral turion leaflets usually lobed or irregular in outline.

F. Leaflets on flowering shoots prominently pointed, mostly sharply serrate or even almost jagged, the serratures or teeth prevailingly rounded-acute.

G. Prickles usually not conspicuously expanded at base, rather slender but sharp, only moderately hooked: terminal leaflet of turion leaves broadly ovate to triangular-ovate, subcordate at base: northern and southern. . . . . *13. R. flagellaris*

GG. Prickles with prominent broad base, stout, strongly hooked: terminal leaflet narrower, scarcely if at all subcordate: far southwestern. . . . *14. R. arizonensis*

FF. Leaflets on flowering shoots or laterals obtuse or essentially so, the teeth mostly large, coarse and broad.

G. Canes usually with very few prickles: floral leaves or leaflets for the most part oblong to cuneate-obovate to oblong-ovate, thick, practically glabrous beneath; lateral turion leaflets usually narrow at base: mid-continental. . . . . *15. R. nefrens*

GG. Canes bearing many fine sometimes almost bristle-like prickles: floral leaves or leaflets broad-oval, thin, pubescent beneath; lateral turion leaflets broad at base: central. . . . . *16. R. Baileyanus*

EE. Some and usually all the pedicels short and somewhat aggregated (if more than 1 or 2), and divaricate-ascending: lateral turion leaflets for the most part (at least those of the early season) not lobed or of irregular outline, with small close sharp serratures; leaves pubescent beneath: northeastern. . . . . *17. R. rhodinsulanus*

DD. Plant relatively short or else weak, with an herbaceous look, the base of the turions bearing scale-like caducous bracts: leaves thin, glabrous or essentially so underneath, turion leaflets for the most part not broad-based: flowers mostly solitary: southern and northern. . . . . *18. R. Enslenii*

CC. Turions very stout and extensive, strongly angled or even grooved: prickles large and very broad-based, those on strong canes often 5 mm. and more long. (This contrast is drawn for *R. velox*, but *R. immanis*, which I do not know, may key here: the description of the latter says the stems below are "terete" or obtusely angled," and prickles "rather stout, 6-8 mm. long, nearly straight or recurved").

D. Leaves of flowering shoots mostly simple and conspicuously oblong, often large: probably southwestern. . . . *19. R. velox*

DD. Leaves of flowering shoots mostly ternate or, if not, at least not oblong, being ovate to nearly orbicular: mid-southern. *20. R. immanis*

BB. Inflorescence otherwise,—not truly ascendate, being short-racemiform with few flowers or cymiform (*R. flagellaris* var. *michiganensis* should not be sought here).

C. Flower-clusters short-racemiform, the flowers 5-8 in a broad cluster on spreading pedicels: leaflets, particularly on turions, large with prominent outstanding veins and the margins with a ruffled or plaited appearance, only slightly if at all pubescent: northern. . . . . *21. R. plicatifolius*

CC. Flower-clusters of a cymose form, the large flowers 4-6 and closely subtended by foliage: turion leaflets mostly 3, small (mostly 2 in. or less long) and very broad, usually orbicular-ovate and the point very short, not plicate, pubescent beneath; floral leaves mostly simple: northern. . . . . *22. R. arenicola*

AA. Canes, as well as petioles and pedicels with prominent stalked glands: prickles on turions of two kinds, the lesser ones small or even minute.

B. Flowers very large, 1½ in. or more across, on ascendate pedicels among the leaves: mid-southern. . . . . *23. R. Boyntoni*

BB. Flowers 1 in. or less across, in short racemiform clusters: northern. *24. R. biformispinus*

13. **Rubus flagellaris**, Willd. Enum. Plant. 549 (1809).

R. villosus, Auct., non Ait.

R. procumbens, Auct.

R. subuniflorus, Rydb. in Britt. Man. 498 (1901), apud Rydb. N. Amer. Fl. xxii, 474 (1913), sub *R. procumbens*.

R. aboriginum, Rydb. N. Amer. Fl. xxii, 473 (1913).

Type locality, "in America boreali," founded on a plant grown at the Botanic Garden in Berlin. Type specimen in Berlin-Dahlem (Gent. Herb. Fig. 64), showing a long trailing shoot with a characteristic dead end.

R. procumbens of Muhlenberg (1813) is a *nomen nudum;* Muhlenberg probably had in mind a form of *R. hispidus* (Gent. Herb. 159).

The common deciduous dewberry of the Eastern States, *R. flagellaris*, is the most widely distributed, and probably the most variable, of North American Eubati. It ranges from Maine to Minnesota, Missouri, Oklahoma and to Alabama, northern Florida and Mississippi. In this range it is not unlikely that more than one species is to be recognized.

The plant is often pubescent, particularly on the under surface of the leaves, but this pubescence does not appear to be correlated with other characters and pubescent specimens turn up here and there without geographical range.

An interesting mutant from this species is described by Detjen in Journal of Heredity, Feb. 1920, p. 92, as "A mutating blackberry-dewberry hybrid." It is a cut-leaved form. Although called a hybrid, no evidence of double parentage is presented. My several specimens of the plant show it to be *R. flagellaris*.

Pomological varieties of *R. flagellaris* have been in cultivation but probably are now lost: Lucretia's Sister "discovered or at least introduced by J. B. Treedway, of Brandt, Miami Co., Ohio, about 1886;" (Bailey, Bull. 34, Cornell Exp. Sta. 1891, p. 287). Windom (Cook's Hardy) is supposed to be of Iowa or Minnesota origin (p. 282).

R. flagellaris var. **roribaccus**, Bailey Gent. Herb. 160 t. 66 (1923).

R. Canadensis var. *roribaccus*, Bailey, Amer. Gard. xi, 642 (1890).

R. villosus var. *roribaccus*, Bailey, Sketch Evol. Nat. Fruits, 373 (1898).

R. roribaccus, Rydb. in Britt. Man. 498 (1901).

A robust well-developed race represented in the Lucretia dewberry (on which the variety was founded), distinguished by large cuneate-obovate double-serrate leaflets,

flower stalks 3-6 inches long and strongly overtopping the foliage of flowering shoots, flowers large and sometimes as much as 2 inches across, sepals often developed into long and frequently lobed appendages: fruit large, thimble-shaped, of good quality. The Lucretia was first found in West Virginia in the wild (Bailey, Bull. 34 Cronell Exp. Sta. 287). Similar plants are now and then found in the wild. It probably does not represent a geographic or definitive varietal form, but the name may well be retained because of the horticultural value of the Lucretia, which is the leading cultivated dewberry. To Bicknell the *roribacous* plant is *R. Baileyanus* × *procumbens* (Bull. Torr. Bot. Club, xxxviii, 127) and Rydberg accepts this disposition.

† **R. flagellaris** var. **geophilus**, n. st.

R. geophilus, Blanch. Rhod. viii, 148 (1906). Fig. 107.

Type locality, southwestern Maine. I have reason to think that the plant is widespread although apparently not reported beyond New England; I have Blanchard specimens also from New Bedford, Massachusetts. I have the plant also from Michigan.

This variety is known particularly by its large cut-toothed leaves, or as characterized by Blanchard, "leaves very large, 5-foliate, outline jagged, very coarsely serrate; stemlets very tall; inflorescence a few very erect, large and very long pedicels; fruit remarkably large."

Bicknell makes *R. geophilus* in part *R. Enslenii* × *procumbens* and in part *R. Baileyanus* × *Enslenii*. Rydberg refers it to *R. heterophyllus*, Willd. Brainerd & Peitersen think it *R. Baileyanus* × *flagellaris*. If *R. heterophyllus*, Willd. Berl. Baumz. ed. 2, 413 (1811), is to be identified with any North American species, it is probably to be connected with this Var. *geophilus*, notwithstanding the fact that Willdenow speaks of it as growing two feet high with many procumbent stems: it may have grown vigorously under cultivation at Berlin. See Gent. Herb. 162, 190, Fig. 68. I prefer, however, not to adopt the name, considering it a *nomen dubium*.

My conception of var. *geophilus* covers the pomological Mayes or Austin dewberry, said to have been found wild in Texas. The Geer also is referable here; this variety is probably lost to cultivation. It was "discovered in a wood-lot upon the property of a Mrs. Geer, of Plainfield, Livingston Co., Michigan, by F. L. Wright, a horticulturist of that place. Plants were transferred to the garden in 1887" (Bailey, Bull. 34, Cornell Exp. Sta. 287).

The Thornless dewberry, now propagated in Texas, is apparently *R. flagellaris* var. *geophilus*.

R. flagellaris var. **invisus**, Bailey Gent. Herb. 161 (1923).

R. Canadensis var. *invisus*, Bailey, Amer. Gard. xii, 83 (1891).

R. invisus, Bailey Sketch Evol. Nat. Fruits, 374 (1898).

Type locality, Ithaca, N. Y.; type specimens in Hb. Bailey.; Fig. 108 shows pieces of the plant from the type specimens collected in 1891. The original station was long ago destroyed and the plant has not been rediscovered in its old region although in the early days it was taken in more than one place. I do not certainly know the plant from elsewhere, although I took what I then regarded as the same in northern New Jersey in 1893; and I have turions of what appears to be the same from South Carolina. If I had good specimens like the original plant from a considerable range of country, I should accord it specific rank as I did long ago (1898); the characters would include its strongly ascending not very prickly stems (becoming decumbent and tip-rooting), turion leaflets more regularly ovate than in *R. flagellaris* and not triangular-ovate, margins of leaves with large nearly simple broad apiculate dentation.

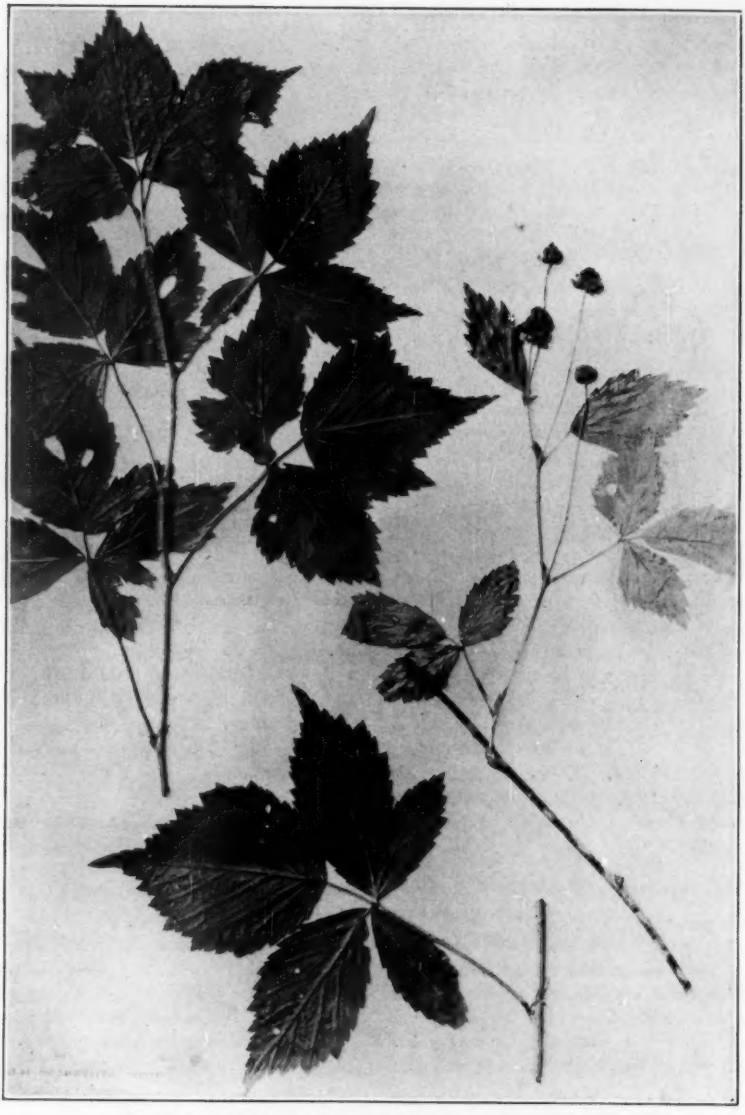

FIG. 107. *Rubus flagellaris* VAR. *geophilus*, FROM ONE OF BLANCHARD'S ORIGINAL STATIONS.

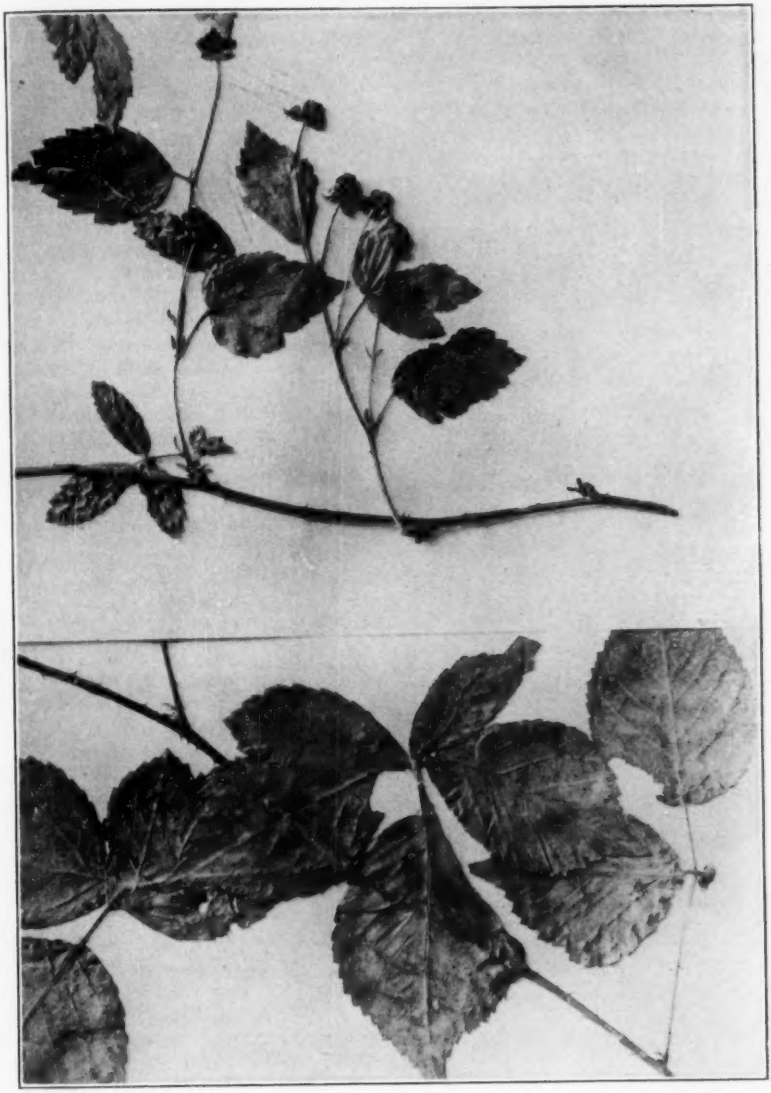

FIG. 108. MATERIAL OF THE ORIGINAL COLLECTION OF *Rubus flagellaris* VAR. *invisus*

Fig. 109 is from a photograph made from the living plant in 1891; it shows the stem, as then described, "stout and stiff, often partially ascending." The late W. R. Dudley, whose eye was keen on the Cayuga flora, knew the plant, and I wrote in my original account of it in 1891, "Professor Dudley, who has given it considerable attention, thinks it may be found to possess sufficient distinctness to make it worth specific rank."

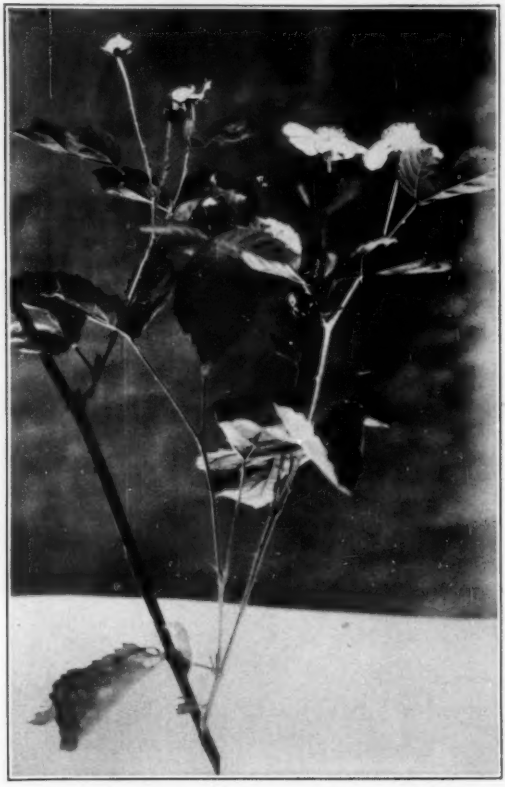

FIG. 109. *Rubus flagellaris* VAR. *invisus*, FROM THE ORIGINAL STAND, SHOWING HABIT.

The name *invisus* has been variously applied, but none of the applications is to the plant I originally described. It was used as of specific rank by Britton in the Bulletin of the Torrey Botanical Club, xx, 279 (July 1893), with *R. villosus* var. *humifusus*, Torr. & Gray as a synonym (see No. 18); a similar use was continued in the Memoirs of the Torrey Botanical Club, iv, 115 (Nov. 1893). This *invisus* of Britton was subsequently incorporated in the conception of *R. Baileyanus* (Memoirs v, 185. May 1894). Brainerd & Peitersen make *R. invisus* a synonym of *R. Baileyanus* × *flagellaris*, but the plant they illustrate (Vt. Bull. 217 t. xxxvi) is not my var. *invisus*. Rydberg, in North American Flora, retains *invisus* as a species, but I am not able to verify the range.

To. var. *invisus* apparently belong the former cultivated dewberries Bartel, Never Fail and General Grant, and what was once grown as Mammoth. The Bartel was brought to notice sometime in the seventies of last century by Dr. Bartel of Huey, Clinton Co., Illinois, the plants having first appeared, as the story went, in an old cornfield on his farm. (Bailey, Bull. 34 Cornell Exp. Sta. 300). The Mammoth of early records was probably the same as Bartel (p. 306); Never Fail appears to have been of Indiana origin; General Grant is said to have come from Tennessee.

R. flagellaris var. **michiganensis**, Bailey, Gent. Herb. 161 (1923).

R. villosus var. *Michiganensis*, Card in Bailey, Sketch Evol. Nat. Fruits 374 (1898).

Type locality, sand banks of Lake Michigan in southwestern Michigan (South Haven, Van Buren Co.), collected by myself in 1880, 1891, 1892 and 1893 and not subsequently taken; once grown at Cornell University. Type specimens in Hb. Bailey., Fig. 110. The plant is known by its large jagged leaflets, pubescent character and a rather close inflorescence with sometimes 7 or 8 flowers. Rydberg combines this plant with *R. geophilus* under *R. heterophyllus*.

14. **Rubus arizonensis**, Focke, Bibl. Bot. heft 83[1], 83 (1914).

R. oligospermus, Thornber; Rydb. N. Amer. Fl. xxii, 470 (1913), non Sudre 1909.

Type locality, Santa Rita Range, Arizona, Pringle (distr. as *R. trivialis*). Also in Santa Catalina Mts., Arizona; near Durango, Mexico, and by Rydberg accredited to other parts in Northern Mexico.

R. arizonicus, Fedde, Just's Bot. Jahresb. xxxiv, pt. 3, 205 (1909) is a very different plant, being *Batidæa arizonica*, Greene, one of the forms of *R. idæus* var. *strigosus*.

† 15. **Rubus nefrens**, spec. nov. Fig. 111.

Planta multo minus aciculosa quam *R. flagellaris:* turionum foliola (præsertim foliolum terminale) angustiora, elliptico-ovata et magis uniformia, fere simplicius serrata: folia juxta flores vel foliola sat obtusa, oblonga vel oblongo-ovata, valde simpliciterque serrata: flores fere simplices (interdum duplices), ex brevibus foliosisque lateralibus orti, pedicelli inarmati.

A much less prickly plant than *R. flagellaris*, with a characteristic light green cast to the foliage, glabrous, glandless: prickles few, scattered on the terete canes and sometimes on the petioles, very short and usually weak, straight or nearly so: turion leaflets mostly 3, sometimes 5, usually narrower and more regular than in *R. flagellaris*, elliptic-ovate, prevailingly more simply and less sharply serrate, specially the terminal one which is never triangular-ovate nor broadened or subcordate at base: floral leaflets or leaves obtuse or nearly so, particularly the ones toward the base of the short laterals, oblong or oblong-obovate, coarsely and simply serrate: flowers single, or infrequently twin, on slender unarmed pedicels from short lateral shoots; corolla ¾-1 inch across, petals obovate. Rocky woods, western Missouri, B. F. Bush, different collections, and apparently elsewhere; specimens first named by me *R. flagellaris* var. *invisus*.

16. **Rubus Baileyanus**, Britt. Mem. Torr. Bot. Club. v, 185 (May 1894), partim.

R. invisus, Britt. Bull. Torr. Bot. Club, xx, 279 (1893), partim.

As the basis of this species I now take the collection of N. L. and Elizabeth G. Britton and Anna M. Vail, in the vicinity of Marion, Smyth County, southwestern Virginia, in Hb. Bailey. (Fig. 112). *R. Baileyanus* is founded on two citations—(1) *R. villosus* var. *humifusus*, Torr. & Gray, which goes into *R. Enslenii* as Torrey & Gray themselves thought it might, (2) *R. invisus*, Britt. Bull. Torr. Bot. Club, xx, 279, which remains the only basis for the species; this *R. invisus* of Britton is founded primarily on the Virginian collection, and my specimen was labelled *R. Baileyanus* by Britton at that epoch. Britton states that "the plant is exceedingly abundant on dry wooded hills in Southwestern Virginia." He writes that "it is also very plentiful on the highlands of Navesink, N. J., in the woods; occurs in Pennsylvania and Central New York;" but I do not know what these citations signify. The plant I now know

as *R. Baileyanus* lacks mature turions, but the floral foliage looks quite unlike that of *R. flagellaris*, having thin coarsely and nearly bluntly serrate leaflets that are obtuse or nearly so, pubescent underneath. The species is not understood, and further collections may greatly modify our conception of it. Most of the material named *R. Baileyanus* in the collections is *R. flagellaris*.

FIG. 110. PART OF TYPE MATERIAL OF *Rubus flagellaris* VAR. *michiganensis*.

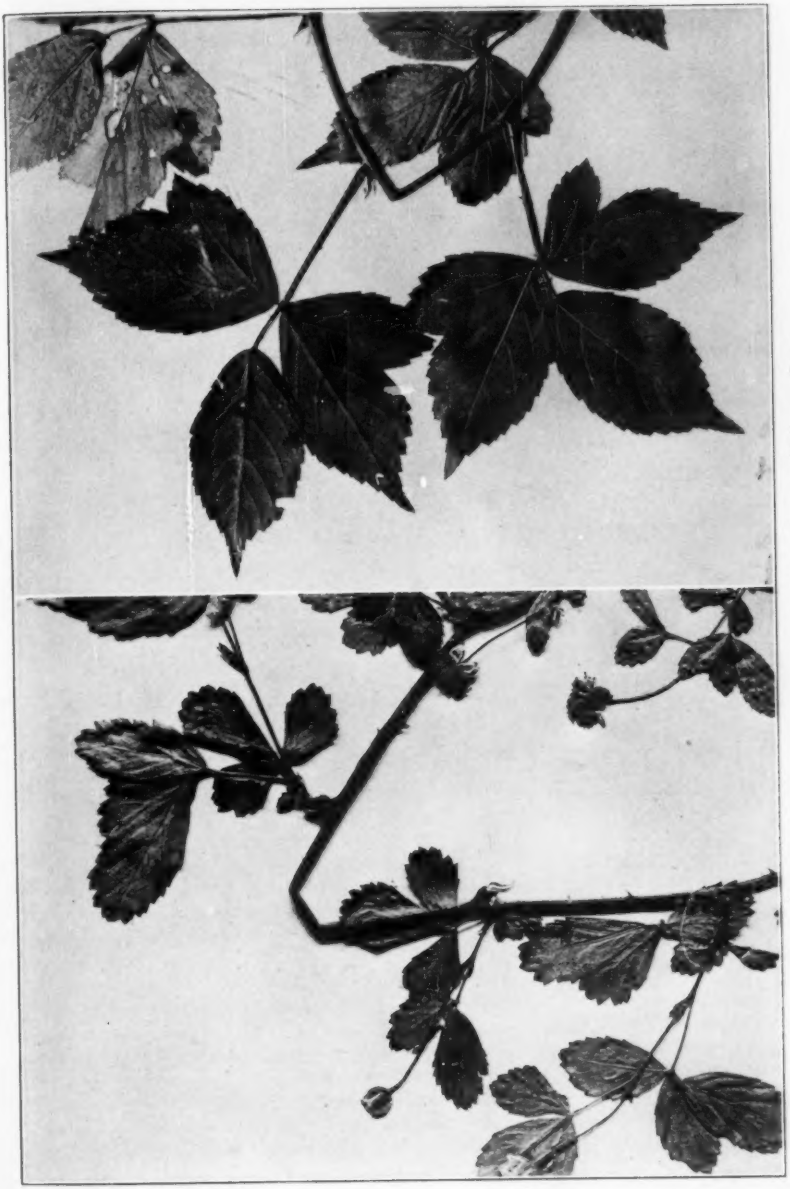

FIG. 111. FLOWERING AND TURION PARTS OF *Rubus nefrens*.

† **17. Rubus rhodinsulanus**, spec. nov. Fig. 113.

Turiones juvenes pæne erecti, sæpe squamiformes bracteas basi gerentes, illi et stirpes immaturæ leviter pubescentes: turionum foliola 3, late ovata et brevia, apice breviter acuta, foliolum terminale 4-5 cm. longum et circiter 3 cm. latum, margine foliola dense acuto-serrata, subtus pubescentia prominentibus costis lateralibus, foliolum terminale breviter petiolulatum basi rotundum vel subcordatum: flores fere 2-5 aggregati in brevi foliosaque inflorescentia in ortis leviter pubescentibus gracilibus pedicellis interdum minimas infirmasque aciculas gerentibus: fructus pæne globosus vel breviter oblongus.

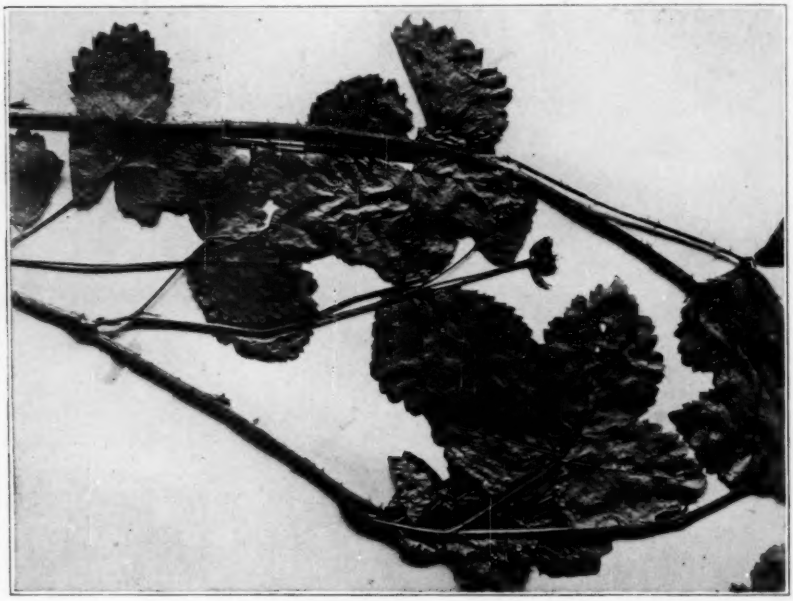

FIG. 112. PIECE OF *Rubus Baileyanus*.

A neat glandless species with nearly erect turions that later become trailing and root at the tip, the young growths with lightly pubescent stems, and leaves pubescent beneath: turion leaflets 3, sometimes 5, broadly short-ovate or even broader, terminal one stalked, about 2 in. long and nearly as broad with rounded or subcordate base, side ribs very prominent beneath, apex of all short-pointed, margins closely sharp-serrate, larger and relatively narrower on old turions, petiole 1-2 in. long and usually somewhat prickly; leaflets on bearing canes narrower and often oblong and obtuse: flowers on short leafy laterals sometimes single but mostly 3-5, on rather short ascendate slender lightly pubescent pedicels that sometimes bear small very weak prickles and a few glandular hairs, the uppermost leaves mostly simple: fruit of good size for the stature of the plant, nearly globular to oblong with large seeds.—Prudence Island, Narragansett Bay, Rhode Island, S. N. F. Sanford. The plant has some resemblance to *R. arenicola*. Mr. Sanford writes that the plants form "more or less circular patches in the dry sandy pastures and 'moorlands,' the runners radiating for 5 or 6 feet from a central root cluster."

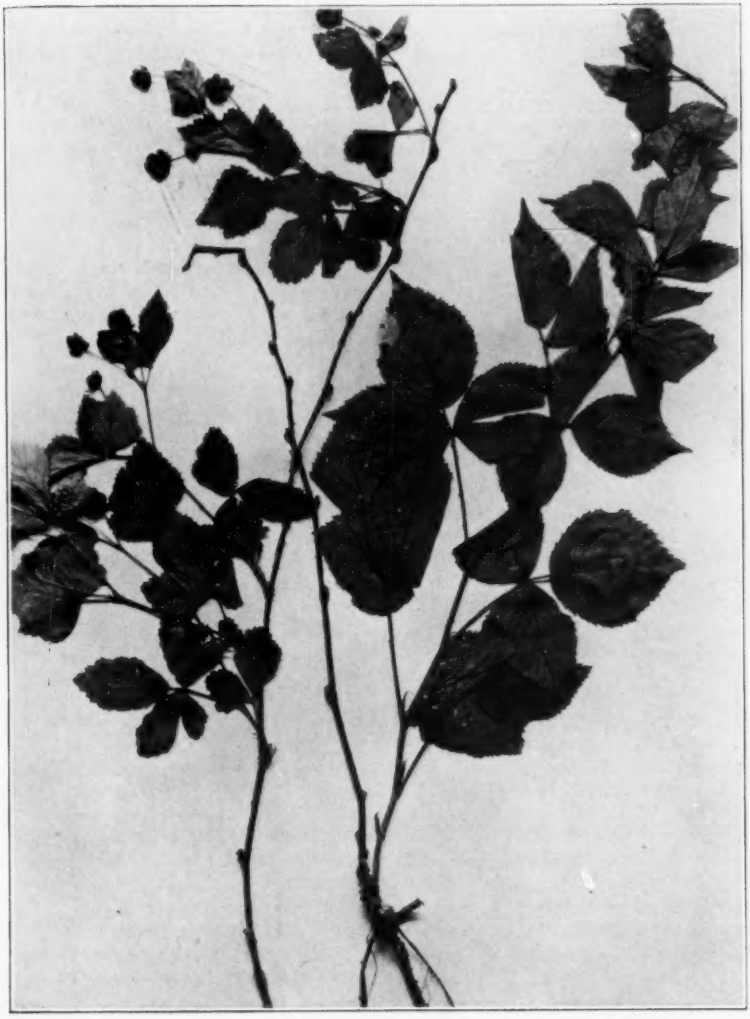

FIG. 113. TURION AND FLOWERING CANE OF *Rubus rhodinsulanus*.

18. Rubus Enslenii, Tratt. Ros. Monogr. iii, 63 (1823).
R. villosus var. *humifusus*, Torr. & Gray, Fl. N. Amer. i, 455 (1840).
R. invisus, Britt. Bull. Torr. Bot. Club, xx, 278-9 (1893) ad syn. partim.
R. Baileyanus, Britt. Mem. Torr. Bot. Club, v, 185 (1894) ad syn.
R. villosus var. *Enslenii*, W. Stone, Ann. Rept. N. J. State Mus. 1910, 480 (nomen).

Type locality "in America septentrionali," without place or habitat. The species has been attributed to various parts of the eastern states, which means that it has not been understood. It appears not to be recorded just where Aloysius Enslen, the Austrian, collected in North America. In founding the genus Enslenia in his honor, Nuttall speaks of him as one "to whom Mr. Pursh was frequently indebted for many of the rarer plants of the Southern States." (Genera, i, 164). I have now had the pleasure of taking what I think is this species in the edge of a pine wood near Savannah, Georgia, and find it to be an interesting little plant quite unlike any other in our flora (Fig. 114). It rises about 1 foot high, bearing single white flowers 1 inch or more across, in habit over-arching rather than trailing but the tips meeting the ground and taking root. The canes have an herbaceous look, due in part to their slenderness and largely to the little brownish scarious scales or bracts that persist on the lower part of the stem. The stronger canes reach a length of two to three feet. The fruit is small and semi-globular (about ⅜ in. across), of relatively large drupelets which are sometimes only four or five. Where I found it near Savannah the species occurs as separate plants, not in clumps or colonies.

I have what I suppose to be the same plant from the coast of Lake Michigan in southwestern Michigan taken by myself more than 30 years ago (Evol. Nat. Fruits, 376) and abundant material from Southington, Conn., supplied me by W. B. Rossberg; Fernald 16937 from Barnstable Co., Mass., is apparently the same. The West Point (N. Y.) material on which *R. villosus* var. *humifusus* appears to be partly founded (Gent. Herb. 164, Fig. 71) is probably the same; also a sheet in the Torrey Herbarium without locality or collector's date but marked "Hale" and therefore presumably from Louisiana. Whether all these widely separated collections are really one species remains to be seen.

Tracy No. 4105, from Biloxi, Mississippi, which I once thought might be referable to *R. Enslenii* (Gent. Herb. 162), I have now placed in a separate cover under a provisional name, awaiting judgment day.

19. Rubus velox, Bailey Gent. Herb. 168 (1923).

A cultigen, probably native, however, in the Texan or southwestern region but known in cultivation as "blackberry-dewebrry hybrids." Type specimen in Hb. Bailey. (Gent. Herb. Fig. 73). In pomological dewberries it is represented by McDonald, Sorsby May, Spalding, Sonderegger Early, Hogo, and probably Dallas.

20. Rubus imman'is, Ashe, Journ. Elisha Mitchell Sci. Soc. xix, 8 (1903).

Type locality, "banks of Watauga River, Watauga Co., North Carolina;" not reported elsewhere. I have no knowledge of this plant except the original description; no specimens are available. Ashe writes that it is "evidently related to *R. Boyntoni*, but far larger and lacking its long, prostrate tips;" but there is no reference in the description to glandulosity. He describes it as rising 2-4 m. high in dense clumps, "at first erect or ascending, then spreading or reclining, at least the tips;" stems glabrous, and nothing is said about bristles or two kinds of prickles; foliage thick and rough-pubescent beneath; racemes 4-8-flowered, with one or rarely two leafy bracts, the lower pedicels longer and ascending.

21. Rubus plicatifolius, Blanch. Rhod. viii, 149 (1906).

R. villosus, Ait. Hort. Kew. ii, 210 (1789) probabl., non Thunb. 1784, cf. Bailey, Gent. Herb. 167.

Type locality, southwestern Maine, and reported by Fernald (Rhod. xxiii, 270) from Nova Scotia; also in Vermont. Marked by the large leaflets of turions which

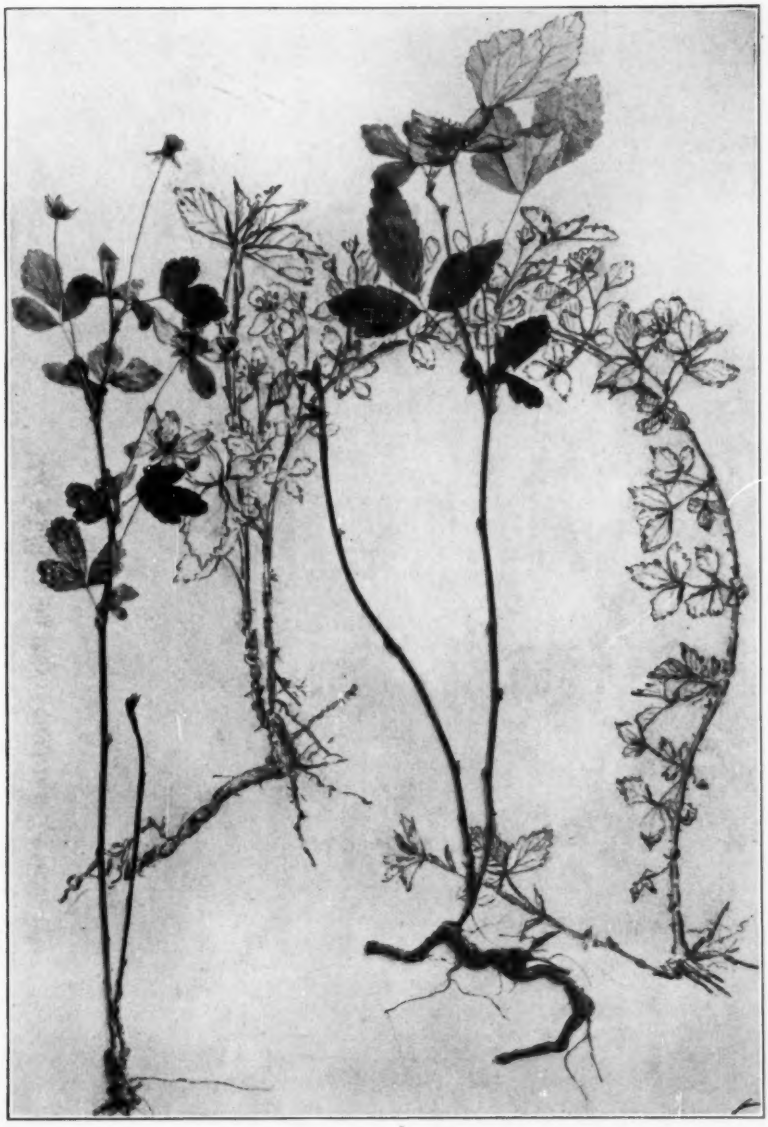

FIG. 114. *Rubus Enslenii* FROM A GEORGIA COLLECTION.

have strong prominent veins and more or less ruffled margins as if plaited; but on the herbarium sheet at least it is often difficult to recognize. Bicknell thinks it *R. procumbens* × *nigricans*, while Brainerd & Peitersen consider it *R. flagellaris* × *frondosus*.

22. **Rubus arenicola**, Blanch. Rhod. viii, 151 (1906) as *R. arenicolus* (cf. nota p. 167).

Type locality, southwestern Maine. Reported from Nova Scotia; also in Vermont and Massachusetts. According to Fernald (Rhod. xxiii, 138), it is "one of the characteristic trailers of Cape Cod and of York County, Maine." The species is well marked; the rather small short broad leaflets of the turions, pubescent beneath, and the condensed leafy pubescent flower-clusters distinguish it. Bicknell thinks it *R. Baileyanus* × *frondosus*, a disposition shared by Brainerd & Peitersen.

23. **Rubus Boyntoni**, Ashe, Journ. Elisha Mitchell Sci. Soc. xix, 9 (1903).

Type locality, "dry soil in Haywood, McDowell, Buncombe and Madison Counties," Western North Carolina. A well-marked plant. Blanchard speaks of it as "a good local species, very frequent in much of Buncombe County, North Carolina, as I know from observation" (Bull. Torr. Bot. Club, xxxviii, 438).

24. **Rubus biformispinus**, Blanch. Rhod. viii, 178 (1906).

Type locality, Kennebunkport, southwestern Maine, and abundant in the neighborhood. Spoken of by Blanchard on his labels as "the glandular trailer." It "tips" freely. Reported by Fernald (Rhod. xxiv, 175) from Nova Scotia, "one of the most characteristic coarse trailers of the sandy roadsides and railroad embankments in southern Yarmouth and Shelburne Cos." A very similar plant is in Crawford Co., Indiana (Deam 27,799 B and C). Regarded by Bicknell as *R. frondosus* × *hispidus* and by Rydberg as *R. nigricans* × *nigrobaccus*. To Brainerd & Peitersen it is a plant of "doubtful status." The tips of turions are often hispid, and the plant might be associated with the Hispidi.

To be associated here is *Rubus elongatus*, Brainerd in Brainerd & Peiterson Vt. Bull. 217, 71 (1920), hyb. nov. *R. allegheniensis* × *flagellaris*. The name *elongatus* is untenable as it has been used at least twice before in the genus. The type locality of this plant is near Cambridge, Washington Co., New York, and the plant is not recognized elsewhere. It "resembles *R. allegheniensis* in having glandular cane and inflorescence and 5-foliolate leaves on turions; resembles *R. flagellaris* in having hooked prickles and prostrate stems; the amount of inflorescence on leaves, shape of leaflets, shape of racemes and number of flowers in racemes are intermediate."

I have studied the specimens of this plant, now at the University of Vermont. However, the material is not clear nor am I convinced that it is all one thing. There are ten sheets, collected on three dates in two years and from three or four stations. Only one sheet represents the flowering or fruiting cane and this strongly suggests one of the upright branching Setosi; the flower-clusters are not like that shown in t. xxxii of Bull 217, representing the plant, (nor, indeed, does that picture match with the key, which designates the "lower flowers not leafy-bracted"). Most of the turion specimens represent a long-running plant with pruinose canes freely rooting at the tips, and with the essential characters of *R. biformispinus*, although one does not care to make a positive identification without more complete material. Fig. 115 shows one of the turion sheets. This plant I should not suppose, from the existing material, to be a hybrid. The labels record it as having autumn turions 8-10 feet long trailing over bushes. Leaflets mostly 5, narrow-ovate and long-acuminate, sharply serrate, pube-

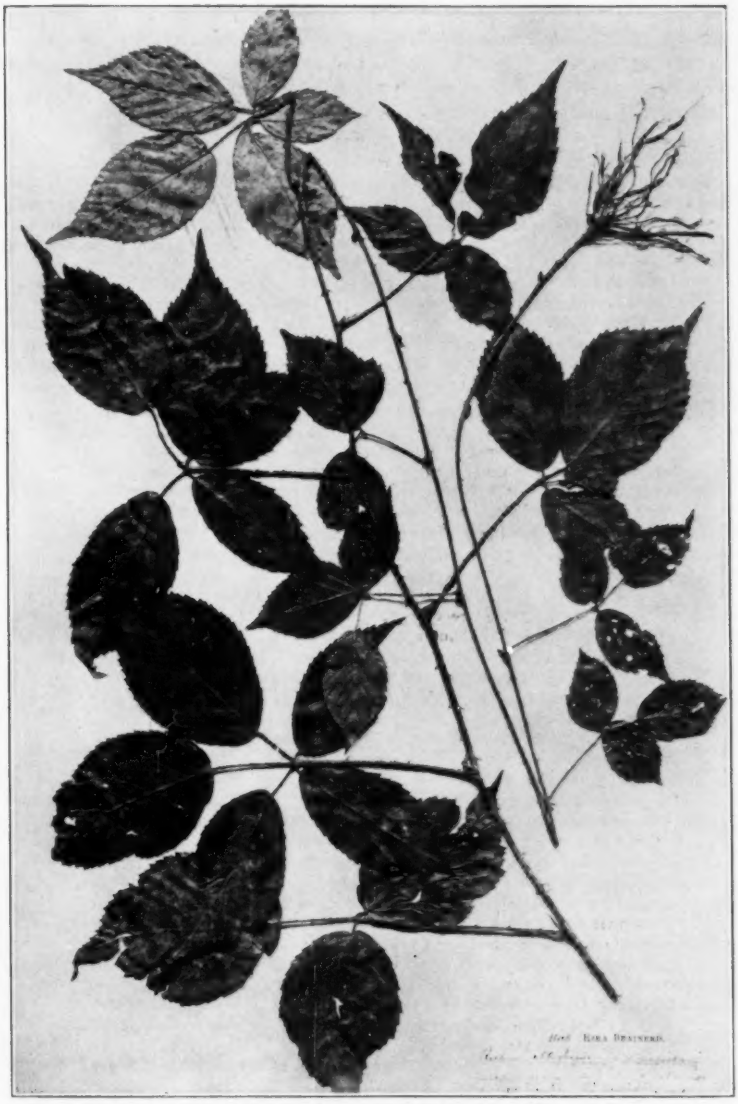

FIG. 115. *Rubus elongatus;* A TIP-ROOTING TURION. PROBABLY REFERABLE TO *R. biformispinus.*

scent to soft-pubescent beneath, strongly side-veined, terminal one at least on prominent stalk, petiole, petiolules and midribs with hooked prickles: canes nearly or quite terete except toward base, bearing prickles and points of different sizes and more or less provided (as well as petioles and often petiolules) with glandular hairs.

IV. HISPIDI

Plants prostrate and trailing or canes becoming so the second year, mostly bearing many small slender but stiff retrorse hispid hairs or very light bristles and often with recurved sharp little prickles intervening (in a var. of No. 28 the bristles wanting): canes slender, often very weak: leaves papery or pergamentaceous, often evergreen or semi-persistent and then shining at maturity, strongly side-veined; leaflets on flowering laterals small and often obtuse-obovate: flower-clusters of the ascending-furcate kind when the flowers are few, but usually on the divaricate racemiform order when 10-12 or more, the flowers commonly subtended by prominent lanceolate or broader often trifid bracts: fruits small, with few drupelets, often reddish at maturity, usually sour. —These associates are a somewhat diverse group, but recent writers agree that the Hispidus characters run through all the Blanchard species here assembled. There are no pomological varieties.

A. Pedicels strongly ascending or nearly erect and when more than 2 or 3 making a cluster of the cymiform kind, when more than a half dozen the lower ones scattered or remote, the cluster (but not the pedicels) often of a furcate kind: for the most part, flowers 6-8 or less: plant trailing or at least prostrate: leaflets on flowering laterals prominently rounded-obovate or broadly oval: foliage often evergreen.

B. Old and new canes bearing few or many bristles, which are weak and slender, but no prickles or only now and then a small one among the setæ.

C. Foliage shining and commonly persistent in winter: canes slender and trailing and freely rooting, mostly bristly and often bearing prominent glandular hairs: leaves on turions commonly or at least often 3-foliolate: flowers small, usually not much exceeding ½ inch across and often smaller: northern with southern extensions. . . . . *25. R. hispidus*

CC. Foliage not shining or evergreen: canes prostrate, little if at all rooting, nearly or quite devoid of bristles and glandular hairs: leaves on turions 5-foliolate, the leaflets oval to narrow-oval and usually narrowed or cuneate at base: flowers large, ¾ -1 inch across: northern. . . . . *26. R. cubitans*

BB. Old and new canes bearing many stiff often rather broad-based prickles, 12-20 or more to the inch: foliage not glossy: turions woody and long, much branched: flowers large and showy, ¾ inch or more across: central. . . . . *27. R. vigil*

AA. Pedicels on representative shoots 8-12 or more in a racemiform cluster, the continuous rachis evident, mostly very short at anthesis but becoming longer and prominently divaricate in fruit, sometimes forked and making a compound cluster: plant seldom flat-trailing but decumbent or becoming so and commonly rooting at tips: leaflets on flowering laterals mostly pointed to attenuate and in most species large (terminal one likely to be more than 1½ in. long): foliage not evergreen. *Jacentes.*

B. Under surface of leaves on turions not soft or velvety to the finger, pubescent if at all only on veins.

C. Calyx not glandular and pedicels the same or bearing only a few weak scattered glands: turion leaflets on the broad order (as ovate or wider), or if narrower then long-pointed, serratures sharp.

D. Stems decumbent, becoming prostrate and rooting at the tip: turions often with prickles among the bristles, the leaflets

mostly narrower than obovate and long-pointed when more than 3: pedicels usually only pubescent although sometimes bristly.

E. Turion leaflets 5-foliolate: northern. . . . . *28. R. jacens*

EE. Turion leaflets 3-foliolate: northern. . . . . *29. R. trifrons*

DD. Stems arching but becoming prostrate: turions beset only with recurved bristles and the leaflets on them obovate with acute tip to nearly orbicular: pedicels very densely pilose and also prickly: northern. . . . . *30. R. arcuans*

CC. Calyx very glandular as well as the pedicels: turion leaflets of the long-oval or cuneate-obovate type not of the ovate or broad kind, abruptly short-pointed, serratures bluntish: northern. *31. R. tardatus*

BB. Under surface of leaves (in full growth) on new canes soft or velvety to the finger: primary prickles weak: leaflets on new canes not taper-pointed although abruptly short-acuminate, very broad, the terminal one commonly subcordate at base: northern. *32. R. permixtus*

25. Rubus hispidus, L. Sp. Pl. 493 (1753).

Type locality, "in Canada." Type specimen in Linnean Herbarium, London (Gent. Herb. Fig. 77). There are two specimens on the Linnæan sheet but they are probably the same plant; it is the small-flowered form.

The hispid dewberry is reported from Nova Scotia to Georgia, Minnesota and Kansas. It inhabits swamps, low meadows, woods and sandy areas. It is widely variable (see Gent. Herb. 175) in size, pubescence, armature, leaf-shape, dimensions of flowers, and other characters.

R. obovalis Michx. Fl. Bor.-Am. 1, 298 (1803), described from plants in the high mountain valleys of North Carolina, commonly referred to *R. hispidus*, may prove to be a distinct species. A photograph of the type is before me. It is the very slender almost herbaceous plant one finds in cool or boggy places from New England southward and westward to Wisconsin, with small very shiny blunt obovate leaflets on the flowering shoots and very small flowers. It has the look of certain Potentillas, or reminds one of a small Waldsteinia or the leaves of Coptis. The Linnæan plant (Fig. 77) is stronger, much more hispid, leaflets tending to be short-pointed. Michaux did not account for the *R. hispidus* of Linnæus.

R. sempervirens, Bigel. Fl. Bost. Ed. 2, 201 (1824) is also the weak form like *obovalis*, judging from Bigelovian fragments in the Torrey Herbarium (N. Y. Botanical Garden).

I have not been able to find dependable differences between the great range of forms referred to this species, but this is not strange in view of the inadequacy of much of the material. If the forms all belong to a single species, then *R. hispidus* is one of the most polymorphous Eubati of eastern North America.

R. hispidus var. *major*, Blanch. Rhod. viii, 212 (1906) was intended to cover size-forms of *R. hispidus* as found by Blanchard in southwestern Maine, but it is doubtful whether all the material distributed by him under this name belongs with *R. hispidus* as now delimited.

26. Rubus cubitans, Blanch. Torreya, vi, 148 (1906).

Type locality, in "dry or rich places, open ground," Westminster, Vt. Characterized by Blanchard as a dewberry of the Hispidus group. Rydberg thinks the plant probably *R. hispidus* × *vermontanus*, and Brainerd & Peitersen make the same disposition.

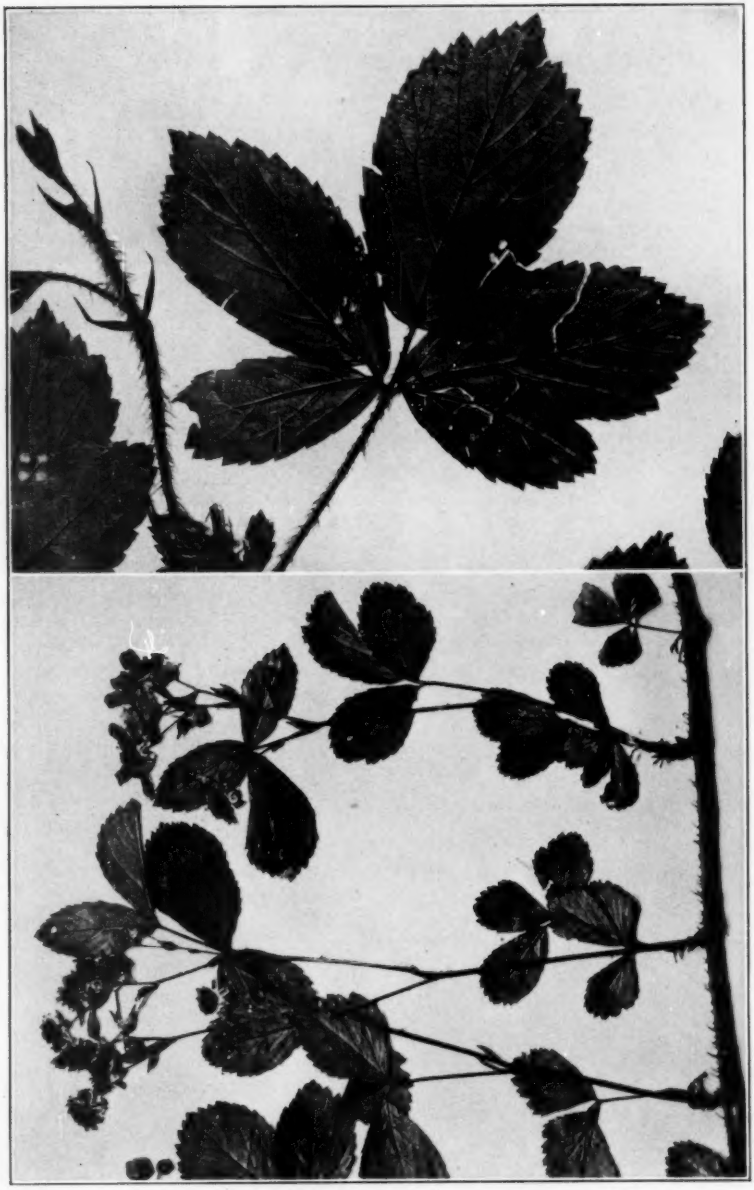

FIG. 116. *Rubus vigil*, FLOWERING PARTS, TURION TIP AND LEAF.

† **27. Rubus vigil**, spec. nov. Fig. 116.

Differt a *R. hispido* multis rigidis acutis reflexisque caulium aculeis, magnis speciosis floribus 2 cm. vel ultra diam. Planta robusta, repens, apice radicans: frons magis minusve persistens; turionum foliola 3 vel 5, magna, oblongo-ovata, 5-6 cm. longa, 2½-3 vel ultra lata, breviter acuminata vel pæne obtusa, subtus venis exceptis glabra; folia juxta flores vel foliola obtuso-ovata, parva: flores 3-6 aggregati in parva aperta inflorescentia, in pubescentibus setosioribus pedicellis.

Known from *R. hispidus* by the very long-running more or less angled much-branching canes rooting only at tips and which are so thickly beset with sharp stiff retrose prickles (that may be more or less broadened at base) as to give them a shaggy look, by the frequency of 5 leaflets in leaves on the main axis of the turions and the prevailingly oblong to cuneate-oblong shape of these leaflets and their tendency to acuteness and sharp serratures rather than bluntness or rounded ends and blunt serratures, by the dull, not shining, foliage, by the large showy flowers which are ¾-1 inch across, and by the heavily pubescent rather than thinly pubescent to glabrate pedicels: foliage probably not persistent: turions reaching several feet and mostly flat on the ground but sometimes at first ascending and then making a basal arch to 18 inches high, late in the season sending out many very slender small-leaved tip-rooting laterals: bristles few or none and more or less gland-bearing: leaves of turions large, 3- or 5-foliolate, terminal leaflet stalked and others nearly or quite sessile: leaflets oblong-obovate to cuneate-obovate, particularly on the main turion axis, and the apex abruptly pointed, 2-3 inches long, glabrous underneath except on veins, coarsely and the main ones rather sharply serrate; petioles prickly and sometimes bristly; floral leaflets or leaves cuneate-rounded to oval, *hispidus*-like: flowers 3-6 in small open somewhat forking clusters on very pubescent stout pedicels that may bear a few bristles and sometimes a few glandular hairs; petals oblong-obovate.—On open sunny lands and about bushes in District of Columbia (about 55th St., N. E.), collected by myself in 1924 and 1925. A plant from North Carolina, with even stouter prickles, may be the same species.

28. Rubus jacens, Blanch. Torreya, vi, 147 (July 1906).

Type locality, Alstead, New Hampshire, for which place it was first named (but not published) by Blanchard; reported by Fernald in Nova Scotia, and by Fernald and Wiegand (Rhod. xxv, 211) in New York. By Blanchard the species was regarded as a dewberry of the Hispidus group. Blanchard characterizes the species as having "thin, narrow leaflets," but some of his specimens from the original locality have broad heavy leaflets. It is *R. hispidus* × *vermontanus* to Rydberg, and *R. hispidus* × *setosus* to Brainerd & Peitersen; Bicknell refers it to *R. nigricans*.

Whether a series of mutants or a phylogenetic species, *R. jacens* represents a marked type. It is so widespread as to challenge the assumption of hybridity everywhere as between the same species.

† **R. jacens** var. **Blanchardianus**, n. st.

R. hispidus var. (?) *Blanchardianus*, Bailey, Gent. Herb. 175, t. 79 (1923).

Type locality, Townshend, Vermont, and not recognized elsewhere. Type specimen in Hb. Bailey. (Gent. Herb. Fig. 79). A plant with very firm cut-toothed leaflets that are prominently ribbed: bristles soft, prickles none. In my original description I said that "it may be a form of *R. jacens*" rather than of *R. hispidus*, and this conclusion I have now reached.

† **R. jacens** var. **specialis**, var. nov. Fig. 117.

Valde a *R. jacente* differt aciculosissimis caulibus pæne vel omino setis destitutis: turiones validi angulatique: aculei declinati, acutissimi, 12 vel plures in 1 cm.

Plant deviod of bristles except on new soft turion growths but strongly armed with sharp retrorse prickles, the canes stout and angled, the prickles 30 or more to the inch and of different sizes, glands few or none: turion leaflets 5, oval to narrowly lance-ovate, long-acuminate, coarsely serrate, strongly side-ribbed, glabrous and lighter-

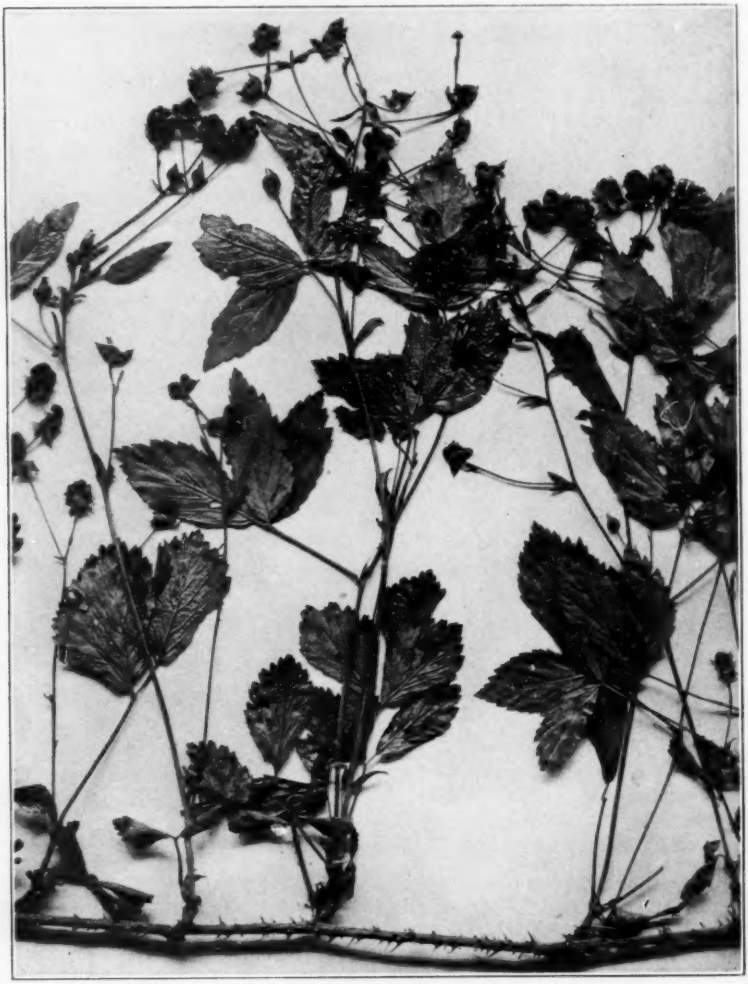

FIG. 117. FRUITING PARTS OF *Rubus jacens* VAR. *specialis*.

colored underneath; petioles prickly but without bristles, sometimes bearing a few glandular hairs; floral leaflets oblong-pointed or sometimes cuneate on lower half: flowers many (8-10 or more) in loose large clusters with long divaricate more or less glandular pedicels.—Londonderry and Worcester, southern and north-central Vermont, 1903 and 1916 (Hb. Bailey.), collected by Blanchard. The former collection is ticketed a dewberry; he complains of the extent to which it pricked him; one would think it to be as unpleasant to collect as Schrankia. Blanchard was unable to place his collections. Of the Worcester plant he notes: "This thorny plant seems to be a 'special creation'."

I had given this plant specific rank with full diagnosis, and I may return to that estimate of it if subsequent collections confirm its character.

29. Rubus trifons, Blanch. Amer. Bot. xi, 11 (1906).

Type locality, in old pasture on "open land," West Wardsboro, southern Vermont, and by Blanchard collected elsewhere in Windham Co.; by Pease (Fl. Coös Co., 277) reported in northern New Hampshire. Blanchard compares the species with *R. hispidus*: "the new canes do not hug the ground, but are kept up by the great mass of old growth and tip rather sparingly." Rydberg regards it *R. hispidus* × *nigricans*. Brainerd & Peitersen consider it the same hybrid as *R. jacens* (*hispidus* × *setosus*). From the herbarium material I also thought it a form of *R. jacens* and in the first draft of this manuscript I made it a var. of that species; since then I have collected the plant in the Wardsboro pasture (now overgrown) and also at Stratton, and the search failed to reveal any 5-foliolate leaves or other departures toward the character of *jacens*.

30. Rubus arcuans, Fernald & St. John, Proc. Boston Soc. Nat. Hist. xxxvi, 78 (1921).

Type locality, dry open soil, Dundee, Prince Edward Island, Fernald, Long & St. John No. 7652, (Hb. Gray.); reported by St. John also in Nova Scotia and at Cape Cod, and by Kidder (Rhod. xxv, 147) from Maine. Not recorded as rooting by the tips. I am none too certain of the systematic position of the plant.

31. Rubus tardatus, Blanch. Rhod. viii, 214 (1906).

Type stations, on "the west road from Kennebunk village to West Kennebunk, Maine;" found also in neighboring places. Recorded by Fernald (Rhod. xxiii, 271) as "a dominant and very constant species of boggy thickets and lake-margins of Nova Scotia and of Prince Edward Island." Blanchard speaks of it as "a dewberry;" some of his specimens are ticketed "Bartlett's trailer." Bicknell refers the plant to *R. nigricans;* Rydberg thinks it *R. amicalis* × *nigricans*; Brainerd & Peitersen make it *R. flagellaris* × *setosus*.

The Blanchard material in my possession, from southwestern Maine, is not homogeneous. I take as my conception of the plant the specimens with long turion leaflets ("long oval" as Blanchard writes) on the cuneate-oblong-obovate order, with abrupt short point and bluntish serratures; it is then readily distinguished from the *R. jacens* company as well as by the glandular calyx and pedicels.

What Fernald reports as *R. tardatus* (Rhod. l.c.) is "one of the most characteristic 'half-high' species of damp thickets" in Nova Scotia; and he elsewhere (Proc. Bost. Soc. Nat. Hist. xxxvi, 79) mentions it as having "broadly lanceolate leaflets tapering to each end" with numerous relatively weak prickles and copiously glandular pedicels. Blanchard describes "pedicels and peduncle with numerous glanded hairs."

32. Rubus permixtus, Blanch. Torreya, vi, 117 (1906).

Type locality, Putney and Westminster, in southern Vermont. Bicknell thinks it *R. hispidus* × *allegheniensis*, and Rydberg considers it *R. hispidus* × *nigrobaccus*. Brainerd & Peitersen write it *R. alleghenienses* × *hispidus*, and make its range Vermont, New Hampshire, eastern New York, and New Jersey. It "tips" freely. The pubescent character, elongated inflorescence, and strong glandulosity, are marks of this species or class.

V. SETOSI

The setose or bristly low-bush blackberries: standing species (not trailers) mostly of rather low stature (not often exceeding 3½ feet), the old canes often decumbent or sometimes with prostrate ends, prevailingly bristly or setose in various degrees, sometimes with real prickles among the bristles: leaves with strong impressed side ribs or veins and usually with a plicate or ribbed appearance (at least when dry): inflorescence habitually of the divaricate order, short-racemose and sometimes slightly branched or compound, the flowers commonly small: fruit small, globular to short-oblong, red to about black: all northern.—A confused group to the systematist; one does not know whether the species now seggregated are too many or too few.

There are no varieties grown for fruit.

A. Armature of the turions comprised of numerous and slender bristles (100-200 to the inch) and mostly without real prickles intervening, the bristles usually persisting the second year (The var. of No. 35 may be sought here): plant variously glandular except in var. *Groutianus*. . . . . *33. R. setosus*

AA. Armature of the turions of fewer bristles (usually 50 or less to the inch) and for the most part rather stout, sometimes of prickles without intervening bristles, the bristles likely to have vanished by the second year.

B. Plant weak or slender even if erect, often becoming decumbent: under surface of leaves glabrous or only thinly pubescent on the veins: glandulosity various.

C. Glandular hairs present in the flower-cluster: plant bearing soft flowering stems and with a "flimsy look." . . . . *34. R. junceus*

CC. Glandular hairs absent from the flowering cluster (except in the anomalus var. of No. 35) and usually elsewhere.

D. Leaflets on flowering shoots of the broad and ovate kind: inflorescence diffuse and open or soon becoming so, in fruit usually about as broad as long, flowers often as few as 6 or less; rachis and pedicels only lightly pubescent, the pedicels slender at full anthesis and later: calyx-lobes narrow, spreading or reflexed in fruit.

E. Leaves glabrous underneath. . . . . *35. R. vermontanus*

EE. Leaves more or less hairy on veins underneath. *36. R. semisetosus*

DD. Leaflets of flowering shoots narrow or elongated, at least the terminal one long-narrowed toward base: inflorescence on primary or main flowering shoots regularly racemiform, in fruit longer than broad, 8-12-flowered; rachis and pedicels prominently pubescent, the pedicels short and usually not much exceeding the large bracts: calyx-lobes broad, erect in fruit. . . . . *37. R. miscix*

BB. Plant stiff and erect, the second-year canes bushy-branched above: leaves pubescent underneath: usually a few glands in the inflorescence. . . . . *38. R. ascendens*

33. Rubus setosus, Bigel. Fl. Bost. Ed. 2, 198 (1924); D. C. Prodr. ii, 563 (1925).

R. hispidus var. *setosus*, Torr. & Gray, Fl. N. Amer. 1, 456 (1840).

R. hispidus var. *suberectus*, Peck, Rept. N. Y. State Museum, xliv, 143, ann. 1890 (1892).

R. nigrobaccus × *strigosus*, Bailey & Card, in Card Bush-Fruits, 326 (1898).

R. nigricans, Rydb. in Britt. Man. Fl. N. States & Can. 498 (1901).

Type locality, "in a swamp at Sudbury" near Boston; "received also from Dr. Payne, Montreal" (Bigelow). Three small pieces of *R. setosus* from Bigelow are extant in this country, on two sheets in Hb. Torrey., collected in Sudbury; the sheet with two specimens is shown in Gent. Herb. Fig. 80, and the third specimen does not differ. Another specimen is in the Candollean Herbarium at Geneva, where it has been photographed by Fernald; it was sent to A. P. de Candolle by Bigelow, and De Candolle described the plant in the Prodromus, accrediting it to "Bigelow in litt." The specimen is singularly like those in the Torrey Herbarium. In all the specimens the inflorescence is in bunchy heads and this at first puzzled me; apparently the flowers had wilted when the specimens were put in press. I can almost match them in my own herbarium. If the flowers had been thus aggregated in the living plant, Bigelow would not have described them as "in racemes," a statement that is repeated in the Prodromus. None of the specimens shows turions, but only small flowering pieces with narrow leaflets, fine bristles, with calyx and pedicel prominently glandular-hairy and fewer glands on the other upper growths; there are no prickles: Bigelow writes "without prickles, but thickly covered with strong bristles."

The weak and slender specimens of the original collection, the small simple inflorescence, and the fact that Bigelow describes the fruit as red, has lead to the opinion that there are really two species involved in what is commonly known as *R. setosus*. In fact, Britton and Brown suppose that Bigelow's *setosus* is a hybrid, apparently between what is now called *R. nigricans* and *R. hispidus* (Ill. Fl. Ed. 2, vol ii, 279).

Rydberg makes two species: *R. setosus* with more or less persistent foliage, stems bristly but not glandular, inflorescence elongate and simply racemose and more or less glandular-hispid, fruit red; *R. nigricans* with stems bristly and glandular, inflorescence corymb-like or short-racemose and often branched and leafy-bracted below and densely glandular-hispid or bristly, fruit becoming almost black. This division restricts *R. setosus* to the limited diagnosis and specimens of Bigelow in "Massachusetts, Connecticut and New York." Whether there are two species must be left for fuller study, but I am unable to make out good lines of division in the rather abundant material I have examined. At first sight, some of the material with compound inflorescence looks to be very distinct, but there are all kinds of gradation, sometimes there are simple and branched clusters on the same plant, and I am unable to correlate the differences in inflorescence with other characters. Blanchard vigorously holds that the two are one species (Amer. Bot. vii, 3; x, 108. Rhod. viii, 213); Brainerd & Peitersen also maintain one species.

I possess a specimen of *R. hispidus* var. *suberectus* from Dr. Peck (1891); it is the *nigricans* kind of *setosus*.

The range of *Rubus setosus* is from Newfoundland and Prince Edward Island to Wisconsin and Pennsylvania, mostly in low or wet grounds and swamps.

† **R. setosus** var. **Groutianus**, n. st.

R. Groutianus, Blanch. Amer. Bot. x, 108 (1906).

Type locality, two stations in Windham Co., southern Vermont, in the towns of Stratton and Wardsboro; I have taken it in Stratton and also in the town of Grafton; not recognized elsewhere, but we shall probably refer to it material from other states that has prickly but glandless pedicels. Rydberg considers *R. Groutianus* "an almost glandless form" of *R. nigricans*; Brainerd & Peitersen make it *R. elegantulus* × *setosus*.

34. Rubus junceus, Blanch. Rhod. viii, 215 (1906).

Type locality, about Kennebunk (for which place it was once named but not published by Blanchard), southwestern Maine, in "dry ground, open sun and light shade;" extended by Fernald (Rhod. xxiii, 270) to Nova Scotia. In my Blanchard collections I have it from Alstead, southwestern New Hampshire, by him ticketed "dry woods Setosus."

Blanchard's general characterization of this plant is: "Plants with a flimsy look, erect the first year, weak, soft-stemmed, often prostrate the second year, glandless except on the inflorescence, prickles weak, leaves thin, 5-foliolate, flowering early." It "has some resemblance to *R. setosus,*" but "its red stem nearly naked the second year, flimsy delicate appearance, and early flowering easily distinguish it from that species." Rydberg considers it *R. canadensis* × *nigricans;* Brainerd & Peitersen write it *R. canadensis* × *setosus*, and record it from a number of stations in New Hampshire and Vermont. It has a characteristic look.

35. Rubus vermontanus, Blanch. Amer. Bot. vii, 1 (1904).

Type locality, southern Vermont; recorded in New Hampshide by Pease (Fl. Coös Co. 277), in Nova Scotia by Fernald (Rhod. xxiii, 271; xxiv, 176) also in New York by Fernald & Wiegand (Rhod. xxv, 211). Said by Brainerd & Peitersen to be frequent throughout Vermont and New Hampshire. We shall probably recognize it over a much wider range. I have collected it at several Vermont stations. Fig. 118 shows a piece of *R. vermontanus.*

R. vermontanus var. **viridifolius**, Blanch. Amer. Bot. vii, 3 (1904).

R. vermontanus var. *viridis*, Blanch. l. c. in separata.

This variety, with very dark green leaves, differs from *R. vermontanus*, according to Blanchard, in having more slender canes, bristle-pointed prickles smaller, weaker and twice as numerous, and an abundance of stalked reddish glands on stems and inflorescence. Rydberg considers it *R. nigricans* × *vermontanus*, which Brainerd & Peitersen write *R. setosus* × *vermontanus.* Blanchard reported it from the same locality as the species; it is recorded also in New Hampshire (Pease. Fl. Coös Co., 277), and on banks of Lake Victoria, Ontario by Brainerd & Peitersen.

It is difficult to key the var. *viridifolius* understandingly. For key purposes it would be simpler to separate it as a species. We are to heed Blanchard's admonition, however, "that it seems best to call it a variety" and "species-makers are requested to let it rest as such." I have collected the plant, but am not convinced as to its proper position. Two characters chiefly distinguish it: bristles on canes half or more fewer than on *setosus* and twice as many as on *vermontanus*; glandular hairs on the canes and inflorescence, thus marking it from *vermontanus.* I should have preferred associating it with *R. setosus.*

36. Rubus semisetosus, Blanch. Rhod. ix, 8 (1907).

Type locality, "the sand plains of Plainville and Southington, Connecticut;" "an abundant plant in Southern New England, growing mostly on dry ground and especially on sandy soil;" not reported widely. It is frequent in moist or sandy soil at Springfield, Mass. (Andrews, Fl. Springf., 112). It is *R. nigricans* × *recurvans* of Rydberg; *R. Baileyanus* × *setosus* of Brainerd & Peitersen.

The plant is distinguished from *R. setosus,* "into which it probably intergrades," according to Blanchard, "by having hard stems with comparatively few bristles and no glands, and in having the inflorescence nearly naked."

† **37. Rubus miscix,** nom. nov. Fig. 118, right.

R. peculiaris, Blanch. Rhod. viii, 174 (1906), non Sampaio 1904.

Type locality, two stations in York Co., extreme southwestern Maine, at Kennebunkport, and "abundant in Kennebunk and Kennebunkport. Dry ground, open sun or light shade."

A study of this plant discloses an interesting situation. It was referred to *R. vermontanus* by Brainerd & Peitersen in 1920 (Vt. Bull. 217, 39); similar reference was made the following year by Fernald (Rhod. xxiii, 271) in the disposition of Nova Scotian material and on the basis of Blanchard's original specimens; I came to a similar conclusion in 1923 (Gent. Herb. iv, 179). Previously it had been accepted as distinct in the Seventh edition of Gray's Manual (1908), but at that time *R. vermontanus* was not understood. In 1913 (N. Amer. Flora) Rydberg made it *R. nigricans* × *pergratus.*

We are to remember that Blanchard is the author of *R. vermontanus,* 1904, and that he knew it well in his home country in southern Vermont; and yet he not only does not mention this species in his account of *R. peculiaris* two years later but says that *peculiaris* "forms a class by itself." His description does not suggest the Setosus things, and he speaks of *peculiaris* as a "high blackberry" that "has little resemblance to any other species." He evidently had in mind something very different from *R. vermontanus.* Yet I was at first unable to separate his specimens from *R. vermontanus,* and some of them, taken by themselves, are still puzzling although in general distinguished by the elongated leaflets and calyx characters. Of my more than 40 sheets of *R. peculiaris* collected and named by Blanchard I can make two groups, one like *vermontanus* in flower-clusters and the other quite different. It is not to be assumed, however, that two species are confused in them but rather that *peculiaris* is dimorphic in its inflorescence (as are many other Rubi). Blanchard speaks of two kinds of inflorescence, "one strong branch from each old leaf axil" and this bears "racemes" of 8-12 flowers, and "two or more slender ones with less inflorescence;" these latter may be confused with *R. vermontanus* although the narrower longer more cuneate-obovate leaflets usually mark them. The characteristic "regular racemes" of the main flowering shoots are less marked in *R. vermontanus;* and the stouter rachis and pedicels which are prominently pubescent, together with the more compact cluster due to the short pedicels (which little exceed the large bracts), and the different calyx and leaflets compel me to maintain it from the other species; and if I keep it separate I must also bestow it a new name inasmuch as the name *peculiaris,* unfortunately, is invalidated.

What may be the range of *R. miscix* under this new interpretation I do not know. Other of my Blanchard material from the same region but not from the type stations, seems to be the same plant. I have not examined the Fernald material from Nova Scotia referred to *R. vermontanus* through *R. peculiaris.* A characteristic piece of *R. miscix,* showing the "regular racemes," is shown in Fig. 118 right; with this is to be compared the flower-cluster of *R. vermontanus,* Fig. 118 left. It should be said that although Blanchard describes the leaves of his *peculiaris* as "smooth beneath," they are really more or less pubescent on the veins. Typically the plant has dark rather leathery leaves.

38. Rubus ascendens, Blanch. Rhod. ix, 9 (1907).

Type station, Southington, Hartford Co., Conn.; abundant, according to Blanchard, "in Southington, Bristol, Plainville and neighboring towns and in Southern New England generally." It appears not to have been reported by subsequent collectors; but W. B. Rossberg has obtained it for me from the original locality, but

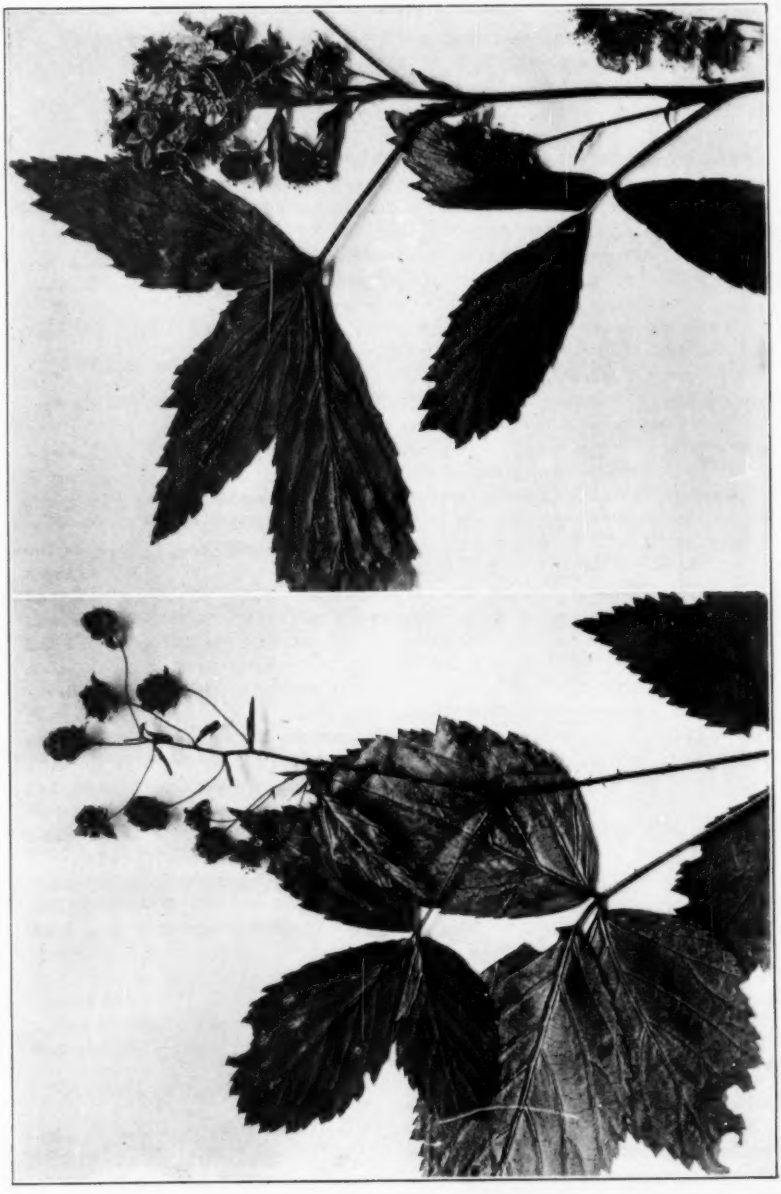

FIG. 118. COMPARABLE PARTS OF *Rubus vermontanus* (LEFT) AND *R. miscix*.

growing with *R. floricomus*. Blanchard compares it with *R. semisetosus*, which he obtained originally from the same region: the plants "are too large, strong, erect, and fruitful as well as too strongly armed to be placed with *R. semisetosus*." He indicates relationship with "small forms of *R. Andrewsianus*." Rydberg refers it, in part, to *R. argutus* × *nigricans;* Brainerd & Peitersen write it *R. argutus* × *setosus*. The wide range indicated by Blanchard is perhaps questionable by his remark that "this species is intended to include not only the plants which closely resemble the type, but also many others which cannot be placed with any species yet described."

VI. Abbreviantes

Erect or diffuse more or less bristly or setose plants, distinguished from the Setosi by leaves dull above with much less plicate appearance, the under surface (particularly of leaves of the early season) soft or velvety to the finger, more evenly serrate and often long-acuminate, giving the plants an Allegheniensis look: northern.—All the recorded plants here assembled have been considered by authors to be hybrids between species of the Setosi and either *R. allegheniensis* or *R. frondosus*. The status of them is to be determined by future study. They might be keyed with the Alleghenienses or others, but the setose armature, mostly low stature, habit and fruit characters, incline me to keep them together at least for the present. Sometimes the setæ are apparently absent, but there will be tell-tale spicules on the pedicels.

The group yields no pomological varieties.

A. Mature leaflets of the turion leaves (or at least the upper ones in the leaf) of the broad-ovate kind or broader: turion petioles, except in No. 42, gland-bearing.
  B. Main mature canes bearing only few and scattered glandular hairs: pedicels habitually bristle-bearing.
    C. Leaflets short and broad, those on the turions abruptly pointed, those at the flower-clusters obtuse or only short-pointed. *39. R. abbrevians*
    CC. Leaflets ovate-acuminate, those at the flower-clusters (or at least some of them) tapering to the point. . . . *40. R. montpelierensis*
  BB. Main mature canes thickly studded with glandular hairs: pedicels not bristle-bearing.
    C. Primary flower-culsters of the elongated racemiform *allegheniensis* type, the flowers usually a dozen or more: glandular hairs on canes short and stout. . . . . *41. R. glandicaulis*
    CC. Primary flower-clusters of the short more or less corymbiform type, the flowers less than a dozen: glandular hairs on canes slender and numerous. . . . . *42. R. frondisentis*
AA. Mature leaflets of the turion leaves of the oval, oblong or lance-ovate kind: petioles of turion leaves not gland-bearing.
  B. Flower-clusters of the elongate racemiform type: prickles on turions rather stout, the base usually somewhat expanded. . . *43. R. flavinanus*
  BB. Flower clusters of the stout more or less corymbiform type: prickles weak, setaceous, very numerous. . . . . *44. R. fraternalis*

39. Rubus abbrevians, Blanch. Torreya vi, 235 (1906).

Type locality, in Windham Co., southern Vermont; Blanchard knew two stations,—on Stephens Hill (type) in the town of Windham, 2000 ft., and in the town of Grafton, 1500 ft., the stations being about four miles apart. Pease reports four stations in Coös Co., northern New Hampshire (Flora Coös Co., 276), and Fernald records it in Nova Scotia. Brainerd & Peitersen report it from other stations in Vermont and New Hampshire. Regarded as *R. frondosus* × *nigricans* by Bicknell (Bull. Torr. Bot. Club, xxxviii, 119) and also by Rydberg; written *R. frondosus* × *setosus* by Brainerd & Peitersen.

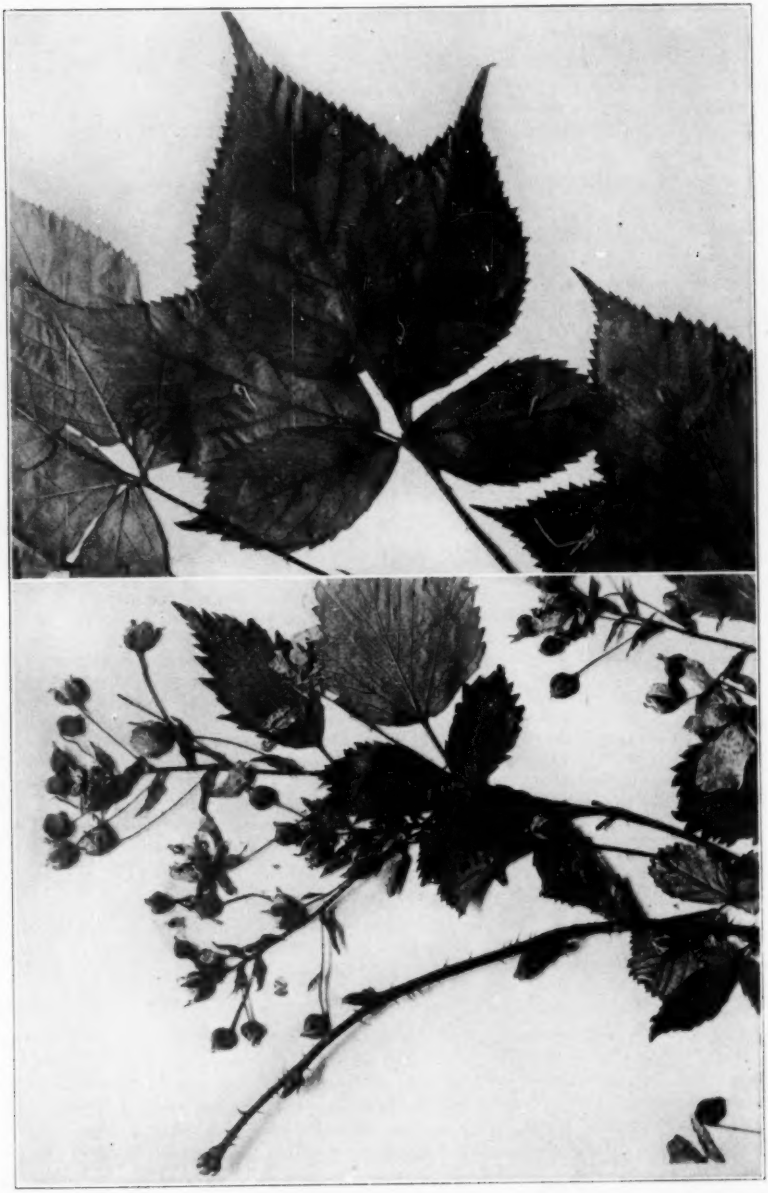

FIG. 119. FLOWERING PARTS AND TURION FOLIAGE OF *Rubus montpelierensis*.

This dwarf plant has short flower-clusters (2 inches long) accompanied by leaves; fruit ½-¾ inch long, sweet, with large drupelets. The very broad leaves of the flowering shoots suggest *R. frondosus*, but it is to be determined whether that species grows within the *abbrevians* range; I have collected over the Grafton locality and did not find *R. frondosus*, nor does Pease report the species from Coös Co. Brainerd & Peitersen record *R. frondosus* proper (excluding "the form *R. recurvans*") as occurring "in Southern New England."

† **40. Rubus montpelierensis**, Blanch. in herb., spec. nov. Fig. 119.

Differt a *R. abbreviante* ovato-acuminatis magis quam brevibus latisque turionum foliolis, oblongis vel anguste ovata forma plurimorum foliolorum floralium vel foliorum quæ sunt sæpe manifeste acuta, etiam magis elongata inflorescentia floribus tenuiter pedicellatis.

Unlike *R. abbrevians* in the ovate-acuminate turion leaflets, the longer flower-clusters and more slender-pedicelled flowers, and the mostly narrower floral leaflets or leaves which are often prominently acute or even tapering. An upright low plant, probably not more than 2-3 feet high; turions glandular and bearing many unequal bristle-like prickles: turion leaflets 3 or 5, ovate and long-pointed, sharply serrate-dentate, soft-pubescent underneath, terminal one prominently stalked (petiolule 1 inch or less long), 3-4½ inches long and rounded or subcordate at base, petiole glandular and armed: main or developed flower-clusters racemiform, with 9 or 10 or more flowers on slender pedicels, the floral leaflets or leaves variable but at least some of them narrow-ovate to oblong and prominently acute or even tapering (sometimes rounded leaves with them); rachis and pedicels pubescent and glandular, more or less armed with sharp bristle-like prickles.—I know this plant from nine sheets in my herbarium collected by Blanchard in 1916 (long after he had ceased publishing on Rubus) at Montpelier, Vermont; also from one unnamed sheet of Vermont collection, 1902, but locality not stated. Blanchard says it "grows on about an acre of abandoned pasture back of the State House." As in other Abbreviantes, there are suggestions of mixed ancestry.

41. Rubus glandicaulis, Blanch. Rhod. viii, 172 (1906).

Type locality, Kennebunk, southwestern Maine. Reported in New Brunswick, Nova Scotia and Prince Edward Island by Fernald (Rhod. xxiii, 268), in New Hampshire by Pease in Flora Coös Co., in Vermont and New Hampshire by Brainerd & Peitersen (Vt. Bull. 217, 61), and in northern New York by Fernald & Wiegand (Rhod. xxv, 210). Considered *R. nigricans* × *nigrobaccus* by Rydberg, which is interpreted as *R. allegheniensis* × *setosus* by Brainerd & Peitersen.

Associated by Blanchard with *R. nigrobaccus* [*allegheniensis*], from which it is distinguished "at a glance by its narrow leaflets, smooth and shining above, and its slender equal pedicels set at a small angle to the axis." It is further distinguished by the double armature.

R. glandicaulis var. **neoscoticus**, Fernald, Rhod. xxiii, 268 (1921).

Differs "in its stouter canes: leaves short-villous above, very densely almost velvety beneath: pedicels stouter, straight." Nova Scotia.

42. Rubus frondisentis, Blanch. Torreya, vi, 119 (1906).

Type locality, Windham Co., southern Vermont, and recorded also by Blanchard at Alstead, adjacent New Hampshire. Brainerd & Peitersen report it from stations in both states, and Pease finds it in many places in Coös Co., Northern New Hampshire. It is *R. nigrobaccus* × *vermontanus* of Rydberg, and *R. pergratus* × *setosus* of Brainerd & Peitersen.

It is a "leafy high blackberry" according to Blanchard. It "is erect, strong and stocky, glandular and pubescent, and the old canes are very leafy, especially when somewhat killed back on rank-growing canes." He notes that it varies between dry and moist rich situations. Blanchard's type station of 1902, when he first noticed it, was "in the immediate neighborhood of the brick school house situated near the residence of Deacon J. O. Follett and in his lot adjoining." I visited the place this year (1925), and although the Follett property has changed hands and the school house is now a tenement, I found the species still persisting.

43. Rubus flavinanus, Blanch. Amer. Bot. x, 69 (1906).

Type locality, Stratton, southern Vermont. I have found it recently at the original station, and C. A. Weatherby sends it to me from Mansfield, Tolland Co., Conn. A dwarf blackberry with the glandular racemiform clusters of *R. allegheniensis*, prominently bracted, bearing many slender hooked or curved almost bristle-like prickles; fruit of only few drupelets. It is *R. elegantulus* × *nigrobaccus* of Rydberg, and *R. allegheniensis* × *elegantulus* of Brainerd & Peitersen. Bicknell interprets it as perhaps a form of *R. allegheniensis* × *hispidus* cross "or possibly a compound hybrid involving *R. nigricans*, i.e., *R. allegheniensis* × *vermontanus*."

† **44. Rubus fraternalis**, nom. nov.

R. fraternus, Brainerd & Peitersen, Bull. 217, Vt. Exp. Sta. 59 (1920), hyb. nov. *R. allegheniensis* × *vermontanus*, non *R. fraternus*, Gremli, 1870.

Type locality, Stratton, Windham Co., southern Vermont; also at Stratford, N. H. According to Brainerd & Pietersen, it "resembles *R. allegheniensis* in having glands on stems and inflorescence and in having pubescent leaves; resembles *R. vermontanus* in having short, broad racemes and globose fruit; the shape of leaf, number and size of prickles and number of flowers in racemes are intedmediate."

VII. CUNEIFOLII

Canes typically erect, usually strict, of low or medium stature, short-jointed and stiff even if prostrate as in No. 46: foliage of a grayish cast mostly because of tomentum or pubescence on the under surface of the leaves which are thick and stiffish and the margins often more or less revolute: armature of strong scattered recurved broad-based prickles on the canes, petioles and pedicels: non-glandular: inflorescence short and, leafy, on the divaricate order: northern and southern.—Distinguished as a group by the stiff and usually erect rigid habit, felt-bottomed or grayish leaves, and abundance of long flat-based stiff usually strongly hooked prickers.

A. Young growth and under surface of leaves white-tomentose: leaflets small (mostly 2 in. or less long), broadly cuneate-obovate or exceptionally oblanceolate, obtuse or very short-pointed: plant stiffly erect but often widely branching and bushy, prevailingly not over 3 ft. high but sometimes taller, the turions mostly appearing late: eastern. . . . . *45. R. cuneifolius*

AA. Young growth and under surface of leaves rusty-tomentose or cinereous to nearly glabrous but grayish, lacking the tomentum of *R. cuneifolius*: habit various.

B. Plant prostrate or lopping, the fruiting canes lying on the ground: leaflets small and obtuse or only short-acute: flowers on long erect pedicels: southern. . . . . *46. R. inferior*

BB. Plant erect and diffuse: leaflets large and taper-pointed, the main ones usually upwards of 2 in. long; flowers in corymb-like open clusters: central and southern. . . . . *47. R. probabilis*

45. Rubus cuneifolius, Pursh, Fl. Amer. Sept. i, 347 (1814).

R. parvifolius, Walt. Fl. Car. 149 (1788) apud Pursh, l.c. not L.

Type region, "sandy fields and woods: New Jersey and Carolina." It is "a straggling briar of gray aspect, the berries hard and dry" according to Pursh. There is no type specimen extant so far as I know, and we must rely on the original Latin diagnosis: "R. ramis petiolis pedunculisque tomentosis sparism recurvato-aculeatis, foliis 3-5-digitatis, foliolis cuneato-obovatis superne inæqualiter dentatis plicatis margine integerrimo revolutis subtus tomentosis, racemis terminalibus paniculatis, pedicellis divaricatis nudiusculis."

Sand blackberry; a stiff erect short-branched plant, 1-2 or 3 feet high (reported to 4 feet), mostly in open and rather sterile lands, Connecticut to Florida and Louisiana, reported west to Missouri; it yields a small but delicious dryish fruit. Abundant on light open lands in Florida.

This species is little known in cultivation. The Eureka blackberry, said to have come from Alabama, belongs here, as also the Oneco, introduced by Reasoner Bros., Oneco, Fla., from native sources.

† **R. cuneifolius** var. **angustior**, var. nov.

Foliola oblanceolata, 4-5 cm. longa, 1-1½ cm. lata, magis minusve acuta.

A narrow-leaved *cuneifolius*, the leaflets oblanceolate, 2 in. or less long and more than ½ inch to less broad, more or less pointed: plant 1-2 ft. tall, erect, much branched, with white tomentose young shoots and under surface of leaflets.

Tallahassee, Fla., Bailey (type); near Ocala, Fla., Bailey; April, 1925.

† **46. Rubus inferior**, spec. nov. Fig. 120.

Differt a *R. cuneifolio* prostrato vel decumbente habitu, fructiferis caulibus humi jacentibus, et albo tomento absente in stirpibus et subter folia; foliola parva, ovalia vel obovata, obtusa vel breviter acuta, illa in ramis fertilibus 2-3 cm. longa: flores albi, parvi, 1-1.5 cm. diam. in longis erectisque pedicellis magis quam corymbosis, 3-6 in laterali stirpe: fructus globoso-oblongus, parvus, durior, saporosus.

A plant with the general "look" of *R. cuneifolius* yet lacking much of the white-tomentose character, the canes prostrate or decumbent and the fruiting ones mostly flat on the ground but not tipping, the flowers small on several long upstanding pedicels from lateral shoots rather than in open corymbose clusters: prickles many and stout and no bristles, leaflets small, oval or obovate and obtuse or nearly so, those on flowering shoots not much exceeding 1 inch long and often less: fruits globular-oblong, black, ¾ inch or less long, firm, good to the taste; the plant rises altogether to about 3 feet.—Open dry field, Ocala, Marion Co., Florida, Bailey, Apr. 8, 1925. In the field one picks it out as of the *R. cuneifolius* kind from its stiff crabbed growth, abundant hard prickles and whitish-bottomed leaves.

47. Rubus probabilis, Bailey, Gent. Herb. 180 (1923).

Type locality, Gate City, Ala.; type specimen in Hb. Bailey., shown in Gent. Herb. l.c. Fig. 81.

Dixie blackberry; a larger and more diffuse plant than *R. cuneifolius*, greener (much less tomentose), with mostly stouter longer and broader-based spines, leaflets more frequently 5, larger and tapering to a pointed apex, fruit larger and juicy. I have the plant from Maryland, North Carolina, Georgia, Alabama and Florida; probably it reaches New Jersey. For more than 30 years I have been puzzled by this plant. At first I tried to refer it to *R. cunefolius* (Cornell Bull. 99, 431. 1895) and later (as in Sketch Evol. Nat. Fr. 326) to expand the conception of *R. cuneifolius* to

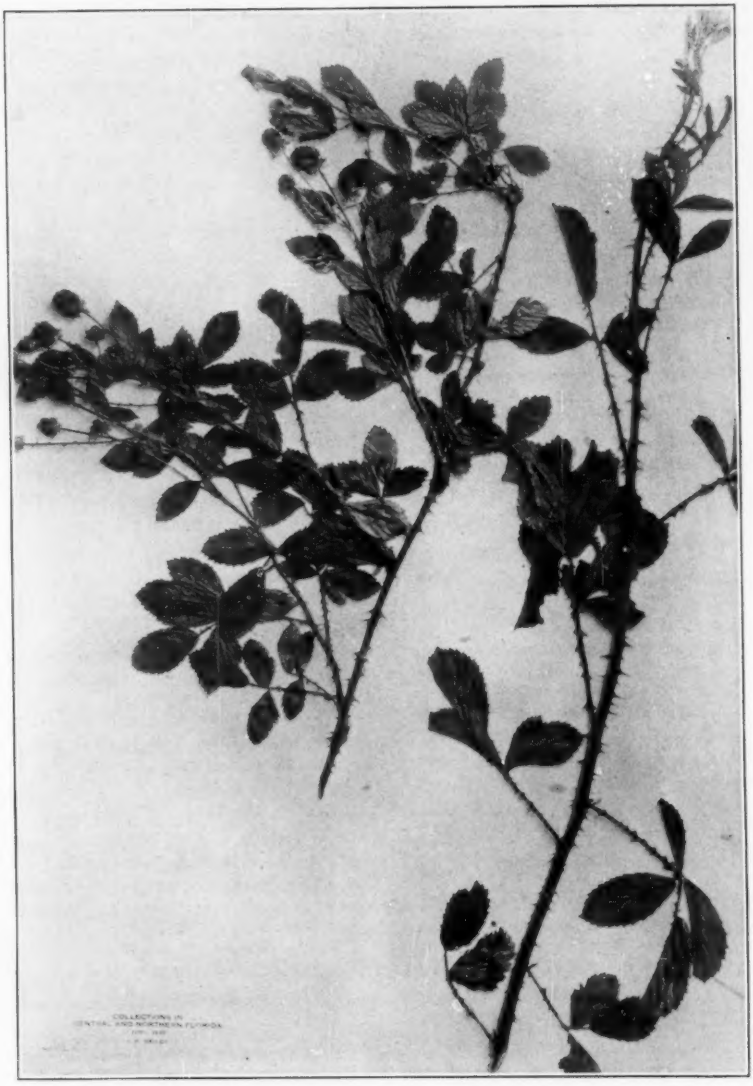

FIG. 120. TURION AND FRUITING PARTS OF *Rubus inferior*.

include it. At one time I thought it possibly an introduced species, but I know of nothing like it in Europe and its wide range is against such an assumption; I also sent material abroad for examination. It has been supposed to be *R. Linkianus*, Ser.; that plant, however, may well be eliminated from the regular North American flora (Gent. Herb. 197). The status of *R. probabilis* remains for the future to determine, but in any case the plant must be recognized. My own material is not homogeneous, but if a few specimens are eliminated that may be hybrids or marked mutants, the species as I now know it becomes clear. The turion leaflets are often much broader than in my Fig. 81.

In cultivation *R. probabilis* has given rise to the Topsy blackberry (renamed the Tree blackberry), grown somewhat a quarter century or more ago, and more recently to the Nanticoke. The former variety was introduced by J. T. Lovett, Little Silver, N. J., to whom it was sent by a man in South Jersey about 1884; Lovett thought it a hybrid between the "sand blackberry and some other species" (Sketch Evol. Native Fruits, 326). The Robinson, now in cultivation, also belongs here.

The cultivated dixies are viciously armed with curved or hooked flat-based spines. Lovett said that he dubbed his plant Topsy because it is so "wicked" with thorns.

VIII. FLORIDI (incl. *Frondosi*).

Plants of diverse habit but distinguished as a group by short leafy flower-clusters which are not of the true ascendate type, the lower pedicels long, broad and mostly heavy leaves, glandulosity wanting or at most not conspicuous, and usually large flowers with broad rounded petals: except in No. 59 the prickles (if present) are relatively well separated, prevailingly not more than 6-10 to the inch on the old canes, with blank itervening spaces: plants erect or recurving, or in an anomalous sub-group even prostrate and rooting at the tips: northern and southern.

A. Canes of stiff woody nature: plant bearing prominent prickles or bristle-prickles on some or all its parts (exception in var. of No. 57), often very stoutly armed.

B. Plant erect or upright, or at least not habitually decumbent or prostrate or tip-rooting.

C. Floral leaflets or leaves on main or primary flowering laterals not cut-toothed or jagged or with narrow teeth (serratures or teeth broad, triangular, or even obtuse).

D. Turion leaflets small or at least not broad, narrow-ovate or narrower, thin, light green, mostly contracted or narrowed toward the base and not subcordate or at most only indistinctly so.

E. Upper leaves or leaflets in flower-cluster 3-foliolate or 3-lobed, or if not then narrowed toward base or at least not betula-like.

F. Leaflets or leaves in flower-cluster of the obovate or cuneate kind, obtuse or only abruptly short-pointed.

G. These leaflets or leaves on most of the branchlets typically rounded or obtuse, thickish, bluntly serrate or almost crenate-serrate: prickles on old canes very flat-based and strongly hooked: plant mostly very tall: southern. . . . . *48. R. floridus*

GG. These leaflets or leaves short-acute, sharply and finely serrate, rather thin, cuneate-obovate, lightish-colored beneath: prickles on old canes essentially straight, little expanded: plant low and stocky: central. . . . . *49. R. rosarius*

FF. Leaflets or leaves in flower-cluster of the oblong, lanceolate or lance-ovate kind, thickish, acute or taper-

pointed, prominently pubescent underneath: central and southern. . . . . *50. R. rhodophyllus*

EE. Upper leaves in flower-cluster simple, small, broad or subcordate at base, betula-like: southern. . . *51. R. betulifolius*

DD. Turion leaflets large and broad (mostly broad-ovate), thick, dark heavy green, the terminal one cordate or manifestly subcordate.

E. Flowers few in the main or primary inflorescences (mostly 6 or less) in a short cluster that does not stand much if any beyond the subtending foliage, the pedicels prominently ascending.

F. Leaves soft-pubescent underneath; turion leaflets rather evenly double-serrate: upper floral leaves or leaflets typically nearly or quite as broad as long: central and northern. . . . . *52. R. frondosus*

FF. Leaves hard, pubescent only on veins beneath (except perhaps the young terminal foliage on turions): turion leaflets irregularly jagged-serrate: floral leaves or leaflets narrower or more pointed: far southern. *53. R. ucetanus*

EE. Flowers several to many (10 or more in the main) in a racemiform cluster with divaricate pedicels, standing well above the accompanying foliage: floral leaves or leaflets usually conspicuously acute or acuminate: northern. . . . . *54. R. amnicola*

CC. Floral leaflets or leaves very sharp-serrate to laciniate-dentate or jagged, the serratures or teeth narrow and long, the lamina usually narrow or else long-pointed: turion leaflets large, on the broad order, the terminal one often not subcordate, more or less pubescent underneath: plants usually recurving or arching, and No. 56 sometimes rooting at tip.

D. Clusters without prominent simple narrow pointed leaves subtending the upper flowers. . . . . *55. R. recurvans*

DD. Clusters bearing prominent characteristic oblong-pointed or ovate-pointed simple leaves at the top accompanying the flowers. . . . . *56. R. Rossbergianus*

BB. Plant of the habitual tip-rooting kind, although canes may be at first semi-erect, becoming prostrate or ends even trailing (No. 56 may sometimes be sought here and No. 59 may not be tip-rooting).

C. Species of ordinary or less than ordinary armature,—prickles scattered or far apart and not prominently hooked or broad-based, the petioles nearly or wholly unarmed.

D. Flowers large, usually more than 1 inch across and the petals broad and prominent: prickles inconspicuous or none: leaves glabrous beneath: pedicels glandless: northern. *57. R. recurvicaulis*

DD. Flowers small, about ¾ inch or less broad, the petals sometimes not conspicuous beyond the calyx: prickles rather prominent, 10-15 to the inch: leaves somewhat pubescent beneath: pedicels often glandular: northern. . . *58. R. semierectus*

CC. Species of extraordinary armature,—"fearfully armed" with long sharp broad-based very stout prickles, those on the petioles strong-hooked and usually many: northern. . *59. R. multispinus*

AA. Canes slender, more or less soft in texture, lacking in hard woody durable structure, standing 2 ft. or less high: plant practically destitute of prickles, such as exist being few and minute: flowers 3-8 in a cymose broad cluster that barely if at all overtops the accompanying leaves: northern. . . . . *60. R. Brainerdi*

FIG. 121. FLOWERING CANE OF *Rubus rosarius*.

48. Rubus floridus, Tratt. Ros. Monogr. iii, 73 (1823).

R. argutus var. *floridus*, Bailey, Sketch Evol. Nat. Fruits, 385 (1898).

Type region, "in America septentrionali," collected by Enslen (see note on Enslen, page 244). The excellent reconstruction of this species in Fig. 90 is a characteristic portrayal. It is a plant of swamps and low grounds and moist woodlands, growing often 8 to 15 feet high and sometimes making long wand-like branches that lop on bushes; yet I have taken it in bloom when only 2 feet tall. Sometimes the flowers are pink. The range is not determined; I have specimens from Tennessee (Lookout Mountain), Georgia, northern Florida, Alabama, Mississippi. I have not seen this plant making colonies or patches.

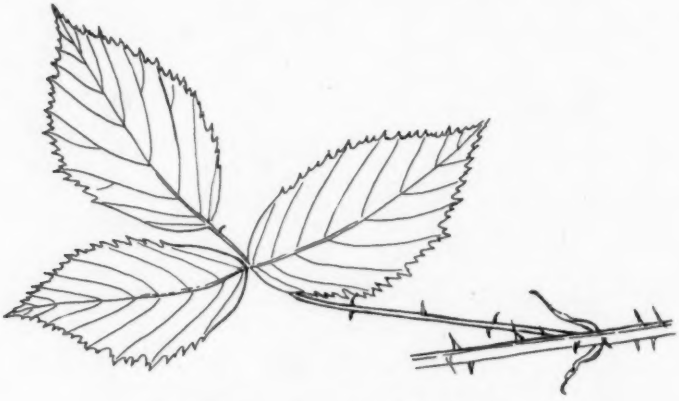

FIG. 122. TURION LEAF OF *Rubus rosarius*.

† **49. Rubus rosarius**, spec. nov. Fig. 121, 122.

Erectus 6 dm. altus, ramosus sed compactus, caules novi et veteres infirmissimos vel setiformes aculeos versus basin gerentes, eglandulosi, multos magnosque flores gerentes: aculei superioris caulis floriferi validi, plerumque manifeste curvati et moderate basi dilatati: folia magis tenuia supra glabri sed non in venis, subtus molliter pubescentia et pallida, margine argute dupliciter serrata, tenuiter petiolata, turionum foliola 3-5-foliolata elliptico-ovata, 5-7 cm. longa manifeste acuminata; foliola in fructiferis caulibus parva, 2-4 cm. longa, elliptico-ovata ad obovata: flores magni multique 2-3 cm. lati aggregati in brevi foliosaque inflorescentia, petala lata obtusissimaque.

An erect plant forming patches, old canes 2 feet tall much branched but the growth compact and leaves small, glabrous except in inflorescence and under surface of leaves, glandless, canes with very slender or bristle-like prickles toward the base, flowers large and profuse with very broad rounded petals, the plant having the appearance of a small single-flowered rose-bush: leaflets elliptic-ovate or sometimes obovate on the flowering parts, thin, much lighter colored beneath, short-pointed, sharply double-serrate, petioles slender: fl. about 1 inch across, more or less, with very broad obtuse petals so that it has a circular or rounded appearance, the cluster short and leafy with 4-10 blossoms.—Open field, Riverdale, Maryland, near Washington, making a conspicuous and showy colony. Probably it is widely distributed southward; some of my imperfect southern material may belong here. Collected by myself.

50. Rubus rhodophyllus, Rydb. in Small, Flora Southeastern U. S. 518 (1903).

Type station, Pointe St. Martine, Miss., Tracy 4107 (Cf. Small, Flora, p. 1331); type specimen at N. Y. Botanical Garden; co-type Hb. Bailey. Rydberg thought this a trailing plant, due to the fact that the specimens he had were lateral shoots with erect flowering parts; my co-type (two specimens) is less misleading. I have taken what I consider to be the same plant at several stations about Washington, D. C., in shade and sun on high land, and I assume it is widespread southward. My Washington plant I first regarded as an undescribed species and gave it a name and diagnosis, but Tracy's 4107 I cannot separate although his collection is without turions or note of habit.

As *R. rhodophyllus* is so little known and apparently so widespread, I add a description of it, drawn from my Washington collections (Fig. 123). It is an erect-arching, lopping or nearly decumbent plant with turions erect or ascending, glandless, soft-pubescent in the flower-clusters and under surface of leaves, rather thin-leaved, standing 2-7 feet above the ground: prickles scattered, mostly one-half inch or more apart, long, not conspicuously broad-based, those on growing parts straight, on old wood curved: turion leaflets 3 or 5, lance-ovate or elliptic-ovate, gradually acuminate, usually narrowed toward base, sharply double-serrate, terminal one 3-4 or 5 inches long and about half as broad, petioles mostly bearing scattered weak small prickles: flower-clusters broad and corymbiform, 5-8-flowered, pedicels sparsely if at all prickly, ascending and the lower one or two remote, floral leaves simple or 3-foliolate, the parts prevailingly lance-ovate to lanceolate, taper-pointed, 1-2 inches long: flowers large, 1-1¼ inches or even more across, showy, sometimes pinkish, petals broad; calyx short and not conspicuous in anthesis: fruit medium size, oblong.

51. Rubus betulifolius, Small, Fl. Southeast U. S. 518 (1903).

I know this interesting plant only from the original collection, Ala. Biol. Surv. 1590, Swamps at Auburn, Lee Co., 8 to 10 feet. Type specimen at New York Botanical Garden; co-type in Hb. Bailey.

52. Rubus frondosus, Bigel. Fl. Bost. ed. 2, 199 (1824).

R. villosus var. *frondosus,* Torr. Fl. U. S. 1, 487 (1824).

R. philadelphicus, Blanch. Torreya, vii, 56 (1907).

Type locality, "road sides in Roxbury," Mass. Two Bigelow specimens are in Hb. Torr. (N. Y. Botanical Garden); Fig. 85 shows the larger one. Although this is a common blackberry in eastern Massachusetts and southward, it is singularly little represented in herbaria. The very broad leaves or leaflets in the inflorescence are characteristic, and they are well indicated in the photograph of the Bigelow specimen (Gent. Herb., Fig. 85). The large pubescent turion leaves with lateral leaflets nearly sessile, the terminal one only short-stalked and manifestly cordate, afford good marks of identification. The branches are often long and weak, and may touch the ground. The range as I know it is from eastern Massachusetts to central-western New York (Ithaca), Pennsylvania and northern Virginia, westward to Illinois and eastern Missouri; imperfect specimens from Wisconsin seem to belong here, and perhaps material lacking turions from Fort Sill, Oklahoma (Clemens 11613, 11613a). Rydberg reports it as far as Iowa and Kansas. Much of the material from Indiana westward is not convincing. The southern and western collections are mostly very spiny.

† **53. Rubus ucetanus,** spec. nov. Figs. 124, 125.

Rigidus aculeosissimus 6-9 dm. altus affinis *R. frondoso,* caulibus glabris et eglandulosis; aculei multi, basi dilatati, turionum aculei recti vel curvati; caulium fructifer-

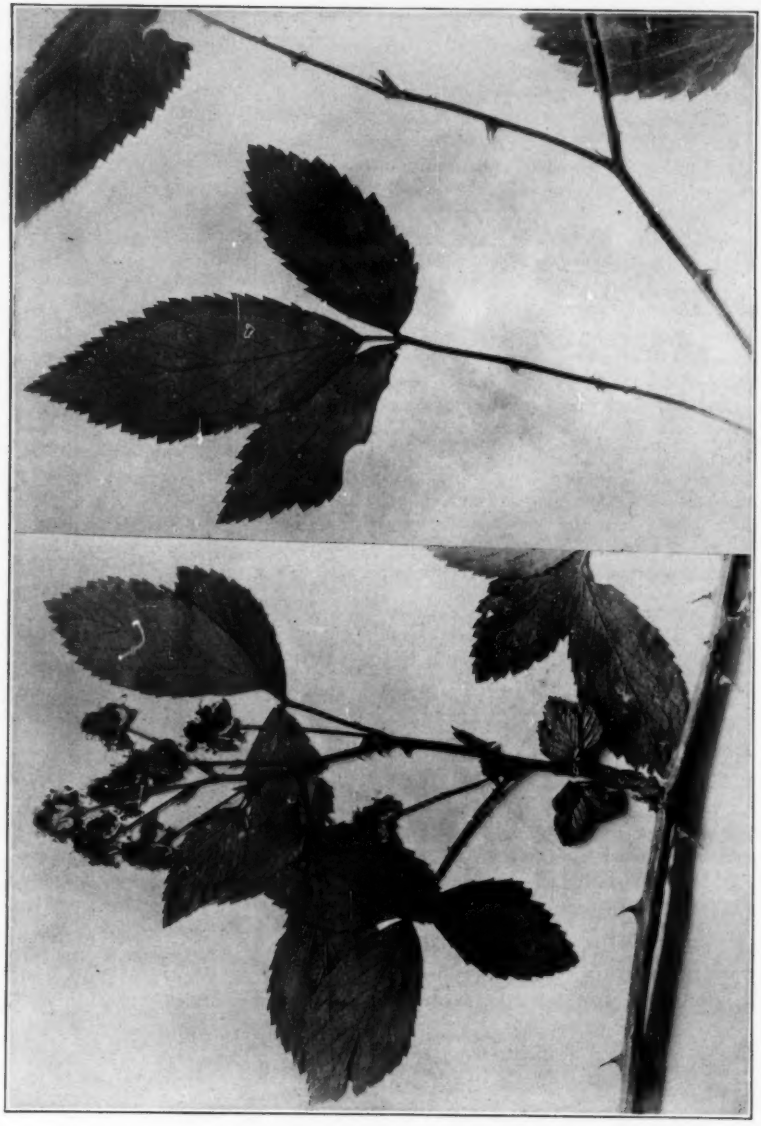

FIG. 123. FLOWERING AND TURION PARTS OF *Rubus rhodophyllus*.

FIG. 124. FRUITING CANE OF *Rubus ucetanus*.

orum aculei manifestius curvati, petiolorum et stirpium florescentium uncinati: turionum foliola 3, ovata, breviter acuminata, dupliciter profunde et acute dentato-serrata, foliola lateralia pæne vel omnino sessilia, petiolulum terminale circiter 1 cm. longa, lamina 6-7 cm. longa et 4-5 cm. lata; caulium fructiferorum foliola densa, in brevibus petiolis, parva et breviter acuminata textu crassa et firma, venis supra impressis subtus prominentibus; omnia foliola supra surdo colore, utrinque venis exceptis glabra venæ transversæ multæ et subtus prominentes: flores pauci aggregati in brevibus foliosisque inflorescentiis, folia floralia vel foliola ovato-acuminata, pedunculi, brevissimi et validi; corolla parva, circa 2 cm. longa.

FIG. 125. TURION LEAF OF *Rubus uccetanus*.

A stout stiff erect low plant, with thick hard leaves that are glabrous both surfaces except pubescent on veins; leaflets broad-ovate and short-pointed, sharply doubly dentate-serrate, those on bearing canes small and short-stalked, mostly under 2 in. long, the terminal one on turions 3 in. or less long and about 2 in. or less broad: flowers 2-4 in a cluster, on very short usually prickly peduncles.—Open ground, Uceta, Hillsborough Co., Florida (near Tampa), Bailey, the plants 2-3 feet high.

54. **Rubus amnicola,** Blanch. Rhod. viii, 170 (1906); Gent. Herb. 167, nota.

Type locality, Kennebunk, southwestern Maine. Reported in Nova Scotia by Fernald who remarks (in Rhod. xxiv, 175) that it is a high-arching shrub, very prolific, bearing fruit of the richest quality, and should be cultivated. Blanchard placed it in the Argutus class, because of its racemiform outstanding inflorescence, and it may well be placed there, but in turion leaves, foliage of the main or primary flower-clusters and other features it is plainly much like *frondosus*. Rydberg refers it direct to *R. argutus;* Brainerd & Peitersen think it *R. argutus* × *canadensis*.

55. **Rubus recurvans,** Blanch. Rhod. vi, 224 (1904).

R. recurvans var. *subrecurvans,* Blanch. Rhod. viii, 152 (1906).

R. arundelanus, Blanch. l.c. 176 (1906).

R. Jeckylanus, Blanch. l.c. 177.

Type locality not stated; in his original account Blanchard writes of the species as "growing chiefly in open sunny places and ranging widely over the New England States, being frequent as observed by the writer in Southern Vermont, Southern New Hampshire, Western Massachusetts, Southwestern Maine, and Central Connecticut." Fig. 126 is a flowering piece of *R. recurvans* collected by Blanchard in Conecticut and ticketed "typical." I have specimens from him so named from Michigan, Illinois,

FIG. 126. A BLANCHARD SPECIMEN OF *Rubus recurvans*.

Iowa, Minnesota and Missouri. Fernald records it from Nova Scotia. Blanchard speaks of it as to merit "a name and take its place with the five or six best marked North American species." I made an historical note on it in my former paper (Gent. Herb. 190), yet I cannot make a clear diagnosis for *R. recurvans*. I accept it with reservations, particularly as to many of the plants of central New York and westward. We seem to be dealing not so much with a homogeneous species as with a range of forms.

Until this range is better understood I prefer to accept *R. recurvans* broadly enough to include var. *subrecurvans* and *R. arundelanus* and *R. Jeckyianus*, all of

which are founded on collections in southwestern Maine, one of the places where Blanchard also collected *R. recurvans*. While there are differences between what may be taken more or less arbitrarily as typical forms of these other kinds, these marks seem to have little diagnostic value. Blanchard's distinctions are not convincing. He states that *R. arundelanus* "resembles the *Recurvans* class in the size and shape of the new cane, but has a hard stem and strong prickles while the leaves are very hairy and pubescent, the leaflets overlapping, thick and somewhat plicate on the margins;" and of *R. Jeckylanus* "the new canes resemble those of *R. Arundelanus*, but the old ones are unique in their polymorphous and mixed characters." Rydberg thinks the var. *subrecurvans* to be *R. canadensis* × *recurvans*, and refers both *arundelanus* and *Jeckylanus* to *R. recurvans*. Brainerd & Peitersen practically agree, inasmuch as they refer *recurvans* to *R. frondosus*; to them the var. *subrecurvans* is *R. canadensis* × *frondosus; arundelanus* is *R. frondosus; Jeckylanus* is *R. argutus* × *frondosus*.

Brainerd & Peitersen refer *R. recurvans* to *frondosus*, on the evidence of the behavior of the plants under cultivation: "The most important character used in distinguishing these two supposed species is the leafy-bracted inflorescence of *R. frondosus* and the more or less lack of such leafy bracts in *R. recurvans*. Our garden cultures have shown that where these two plants are grown side by side there is very little difference in the amount of the leafy bracts." But *R. recurvans* in fact is characterized by leafy inflorescence, and the distinctions lie in part in the character of these floral leaves. Sometimes the species bears elongated clusters relatively clear of the foliage, but this is not the usual state as I know the plant or as it is exhibited in the Blanchard specimens. This variable feature is noted by Blanchard in the original description of *R. recurvans*: "Secondary growth polymorphous and difficult to describe,—leaf-branches, leafy inflorescences and naked inflorescences occurring on all parts of the main axis and often all three kinds growing from the same old-leaf axil, the leaves often all unifoliolate and of all sizes and shapes." Brainerd & Peitersen also include *R. Brainerdi* under *R. frondosus*, but this is so distinct that I hesitate to place it in the Floridi (see page 275).

56. Rubus Rossbergianus, Blanch. Rhod. ix, 7 (1907).

Type locality, Southington, Conn.; Blanchard also reports it from Rhode Island, and "fairly representative plants" from points in Massachusetts. I have taken it in Windham Co., southern Vermont. From stations in Wisconsin I have excellent material collected by A. M. Fuller that I do not yet distinguish from *R. Rossbergianus*. At Ithaca, N. Y., is a plant of this association that I have named and diagnosed as new for this paper, but withhold it for another year's observation. I have abundant recent material from the original locality collected for me by W. B. Rossberg, for whom the species is named. *R. Rossbergianus* appears to be well marked.

57. Rubus recurvicaulis, Blanch. Rhod. viii, 153 (1906).

Type locality, Kennebunk Beach, southwestern Maine. Reported by Fernald in Nova Scotia and by Pease (Flora Coös Co.) in northern New Hampshire. The prickles are usually few, small and inconspicuous; it runs into var. **inarmatus**, Blanch. l.c. 155, nearly unarmed; also var. **armatus**, Fernald, Rhod. xxii, 168, pedicels with bristly setæ.

Specimens of *R. recurvicaulis* often bear resemblance to running kinds of the Hispidi; in some respects it suggests the Setosi. Blanchard related it definitely to *R. recurvans* and, indeed, first referred it doubtfully to that species. Some of my named material from him is ticketed "false recurvans." We need to have a clear convic-

tion as to just what Blanchard intended in *R. recurvicaulis*, and then make careful observations in the field. To Rydberg *R. recurvicaulis* is *R. pergratus* × *procumbens*, and var. *inarmatus* is *R. canadensis* × *procumbens*. To Brainerd & Peitersen *R. recurvicaulis* is a plant of "doubtful status."

58. Rubus semierectus, Blanch. Rhod. viii, 156 (1906).

Type locality, Kennebunk, southwestern Maine. Reported in Coös Co., N. H. (Pease, Flora, 277). A plant of "doubtful status" of Brainerd & Peitersen; it is *R. hispidus* × *plicatifolius* to Rydberg. Probably it is not really separable from *R. recurvicaulis*.

59. Rubus multispinus, Blanch. Torreya vii, 7 (1907).

Type locality, eastern Massachusetts and Rhode Island, in several places. The various Blanchard material is inadequate, and none of it is in flower. I have suspected it of being adventive (p. 194); some of it strongly resembles the European *R. montanus*, Wirtg. It apparently has disappeared from some of the original stations. Plants from other localities that have been referred here are at least doubtful. Not all "fearfully armed" blackberries belong here, for there are marked variations in armature in *R. floricomus* and *R. allegheniensis*; there is also another very thorny blackberry in New England that may be an unrecognized species. Bicknell considers the plant to be *R. frondosus* × *procumbens* (Bull. Torr. Bot. Club, xxxviii, 121), and Rydberg thinks it *R. argutus* × *procumbens*. Brainerd & Peitersen think it *R. argutus* × *flagellaris*.

I do not see the evidence of *R. flagellaris* in the specimens. Blanchard saw none of *R. multispinus* rooting at the tip (although others report it as tipping), nor is it prostrate but only decumbent. He says it "has the appearance of a high blackberry in its leaves and angled stem, round stems being commonly characteristic of recurving and decumbent forms. It trails over walls and fences and alone makes a low hedge of the densest kind." Its habit is probably not far different from some forms of *R. frondosus*. It is described as a glandless species.

60. Rubus Brainerdi, Rydb. N. Amer. Fl. xxii, 467 (1913).

R. sativus, Brainerd, Rhod. ii, 26 (1900), partim.

Type locality, Otter Creek, Weybridge, Addison Co., Vermont. Type specimen in Herbarium of N. Y. Botanical Garden; co-type in Hb. Bailey.

Brainerd supposes, in his original description of *R. sativus*, that he is raising to specific rank my *R. nigrobaccus* var. *sativus*, and he gives no locality for his species. His brief description, however, does not match the plant I originally had in mind (see p. 290). Apparently the confusion started in an identification I made of material from Brainerd many years ago, as I supposed it a "small form" of my var. *sativus;* in my herbarium I still have a specimen of the Weybridge collection that came to me from Brainerd as *R. Baileyanus* but on which I had pencilled "*nigrobaccus* v. *sativus?*"; for this fault I now try to make amends in clarifying the identification of the plant. The specimen at the N. Y. Botanical Garden named by him "*Rubus sativus* (Bailey) Brainerd" shows a very different plant from mine, and it is on this specimen that Rydberg establishes the species *R. Brainerdi*, throwing down Brainerd's name *R. sativus* because of the earlier existence of *R. nigrobaccus* var. *sativus*, Bailey. There is no obligation to discard the name *sativus* as of species-rank because it had formerly been used as of variety-rank; yet because of the danger of confusion in having the name applied to two very unlike plants in the same general flora, even if in different ranks, because of the uncertainty of the designation by

Brainerd, and also because some writer may at any time raise *R. nigrobaccus* var. *sativus* to specific rank, I prefer to follow Rydberg in bestowing a new name on the plant.

The Weybridge plant, which Brainerd had in mind in founding his *R. sativus* (see Vt. Bull. 217, p. 33), has had a devious history (see Fernald Rhod. xxii, 190). In his latest treatment of it (Brainerd & Peitersen Vt. Bull. 217, 31) Brainerd refers it to *R. frondosus*, and I followed his disposition in my former paper (Gent. Herb. 188). I have now made a careful study of the material lying behind this species and have photographs of it; and I have a co-type in my herbarium, as well as two sheets from Brainerd of material grown from transplants from the original locality; and I also have three sheets of the same plant grown at the Arnold Arboretum as *R. sativus*, originally presumably from Brainerd. I have also examined two collections of the same plant by Eggleston: 2893 in Hb. Gr[illegible] from Belden's Falls, Weybridge, Vt., and 1209, 2005 in Brainerd's collection from Twin Mountains, W. Rutland, Vt. All this material represents a plant I think to be different from *R. frondosus* or from anything else I know in our flora. Turion leaflets of some of the material are 5 and very large, on other material only 3 and small; this difference I have not yet reconciled. Moreover, I have what appears to be the same plant from Andover, Conn. (Weatherby 5308a). Weatherby describes his plant as follows: "Canes 2-3 ft. long, 1½-2 ft. high at flowering time, nearly erect to reclining. No prostrate canes noted at flowering time [June 26]; at the later collection [July 27], some canes were longer than the above dimensions and trailing. Leaves not prominently veined, dull. This Rubus was common and very uniform for about two miles along the Hop River Valley."

I am not clear as to the proper classification of this plant, but the species itself begins now to emerge.

IX. ARGUTI

Eglandular blackberries (or sometimes with few scattering glands in inflorescence of No. 67) with short few-flowered clusters standing clear of the floral leaves which are only at the base of the cluster: leaflets for the most part long rather than broad and acute to caudate, those in the flowering shoots plainly obtuse or not rounded: flowers usually medium in size or small, the petals narrow and standing well apart: plant commonly erect, but one or two species of doubtful affinity are otherwise: northern and southern on the eastern side of the continent.—We cannot yet resolve the tangled problems in the true Arguti (A, in the key) and for two reasons: the plants have not been adequately collected; the names are mostly of uncertain application or based on insufficient material. There are undescribed species in the group; for my own use I have named and diagnosed some of them but they are withheld until the subject is more fully investigated. There should be a connected study of the group as a whole. The immediate problem is to determine what the published names signify.

For a discussion of pomological varieties that may belong in the Arguti, see page 296.

A. Inflorescence of the divaricate kind, short-racemiform, or sometimes corymbiform and therefore rather broad.

B. Species with thin and rather small and narrow turion leaflets, mostly green or nearly so underneath (or only grayish-pubescent) and without outstanding straight parallel side-veins, not prominently long-pointed and often sub-obtuse.

C. Flowers in open clusters on more or less elongated branchlets, the floral leaves not conspicuously small nor gray-pubescent beneath: pedicels naked or at least not prominently armed: plant diffuse with few and rather small or weak bristles.

D. Pedicels not conspicuously elongated or slender, most of them less than ¾ inch long: terminal leaflet of leaves on turions and sterile shoots not specially long-stalked: plant slender

and diffuse, with long thin petioles: prickles small and rather weak or at least not vicious, sometimes straight: turion leaflets prevailingly 3, mostly narrow, thin and without numerous or prominent lateral ribs, sharply double-serrate, only lightly pubescent beneath and not velvety to the finger, midrib unarmed or at most with only 2 or 3 small hooks near the base: cluster small and short, usually with less than 8 flowers, floral leaflets or leaves thin, the veins beneath not prominent: central and southern. . . *61. R. argutus*

DD. Pedicels few, slender and long, many or most of them becoming ¾ inch or longer and thereby making a very open cluster: terminal leaflets on turions and sterile shoots conspicuously long-stalked: turion leaflets often 5: otherwise as in 61, but plant perhaps more diffuse, and the young canes grooved or angled: central and northern. . . *62. R. ostryifolius*

CC. Flowers on close short pedicels on very short lateral branches or spurs standing well above the general foliage so that they are showy in the condensed and numerous clusters: floral leaves or leaflets very small and sharp-pointed, stiffish, usually manifestly grayish-pubescent beneath, with side-veins prominent underneath: plant stiff, armed with stout curved prickles: southern. . . . . *63. R. persistens*

BB. Species with firm and stiff turion leaflets which are usually not above middle size, not long-pointed, oblong-ovate to oval: plant with more numerous and curved or hooked prickles, and short stout armed petioles: leaflets prevailingly 5 on turions, with many prominent lateral ribs, closely and mostly simple-serrate, midrib usually armed, under surface usually velvety-pubescent to the finger and becoming fulvous, cluster mostly with 8-12 flowers: eastern, specially southern. . . . . *64. R. crux*

BBB. Species with large soft-pubescent and not stiff turion leaflets that are usually long-pointed and the terminal one prominently subcordate to even cordate, the margins not finely and closely serrate: plants somewhat of the *allegheniensis* look but without glands (or nearly so), the leaflets on turions usually 5, often broad-ovate or even broader: northern and central as far as known.

C. Clusters racemiform, the rachis nearly or quite continuous even though short.

D. Turion leaflets broad-oval or -ovate to nearly orbicular: canes mostly not prominently prickly: pedicels often or usually devoid of prickles or of strong ones. . . . . *65. R. pergratus*

DD. Turion leaflets oval or ovate or narrowly so: canes mostly strongly prickly: pedicels often or usually with stout prickles. . . . . *66. R. floricomus*

CC. Clusters corymbiform at least in fruit, the lower pedicels ascending and nearly or quite equalling the upper ones so that the inflorescence is broad and sometimes more or less flat-topped: northern and probably central. . . . . *67. R. Andrewsianus*

AA. Inflorescence of the ascendate kind, the pedicels few and long and not aggregated into definite flower-clusters, or making loose clusters of a dichotomous formation: plants with sharp prickles.

B. Plant of erect bushy habit but lowermost fruiting laterals often decumbent or almost running: parts strongly armed with hooked prickles: southern. . . . . *68. R. lucidus*

BB. Plant long-prostrate and trailing, although the turions may be at first more or less erect: prickles moderately stout or even rather weak although sharp: southern. . . . . *69. R. tallahasseanus*

61. Rubus argutus, Link, Enum. Hort. Berol. ii, 60 (1822).

Type locality, "in America septentrionali;" described from plants growing in the botanic garden in Berlin. Type specimens in Botanisches Museum, Berlin-Dahlem; Gent. Herb. Fig. 84, showing parts of the two original sheets as photographed by myself in 1897. A subsequent photograph of one of the sheets, by M. L. Fernald, is reproduced in Fig. 127. Placed alongside this, Fig. 128 of a plant from South Carolina shows how well we can match the original by recent collections. I also have

FIG. 127. ONE OF THE ORIGINAL SHEETS OF *Rubus argutus* (BERLIN).

fragments of leaves of Link's original material, sent me from Berlin nearly 30 years ago, with which the South Carolina plant agrees.

In the further study of *R. argutus* it becomes apparent that at least two or three species are involved in even the most recent conception of it. The key differentiates them so far as we now have names to apply to them. How widely *R. argutus* is distrib-

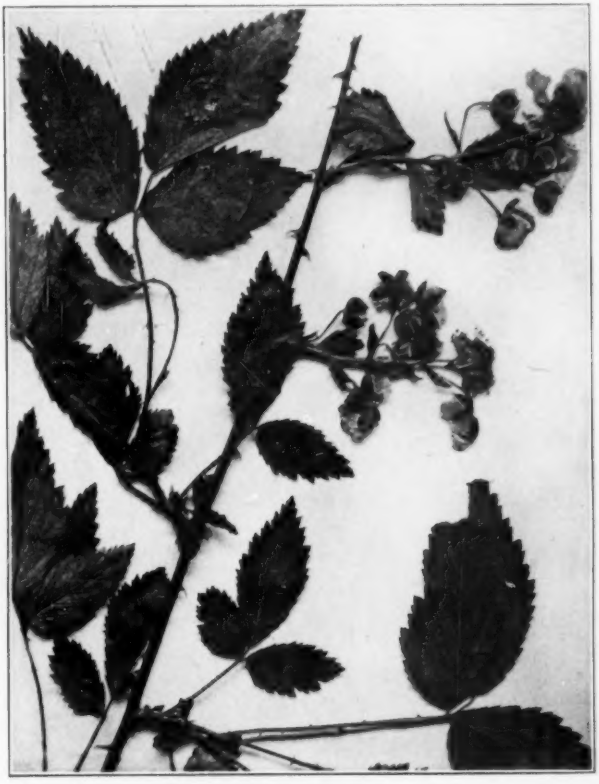

FIG. 128. SPECIMEN OF *Rubus argutus* FROM SOUTH CAROLINA.

uted in North America I do not know. I have specimens from Tennessee, North Carolina, South Carolina, Georgia, Indiana, and less confidently from Missouri. When we once recognize the distinction between this plant and what we have usually taken for *argutus* (i. e. *R. crux*), collections from a wider range will probably come in. It is a slender-stemmed plant that impresses one as only moderately or weakly prickly, with thinnish leaves that have only a light pubescence underneath; flower-cluster short and open, never of the elongated kind, with few rather small flowers; turion leaflets apparently oftener 3 than 5.

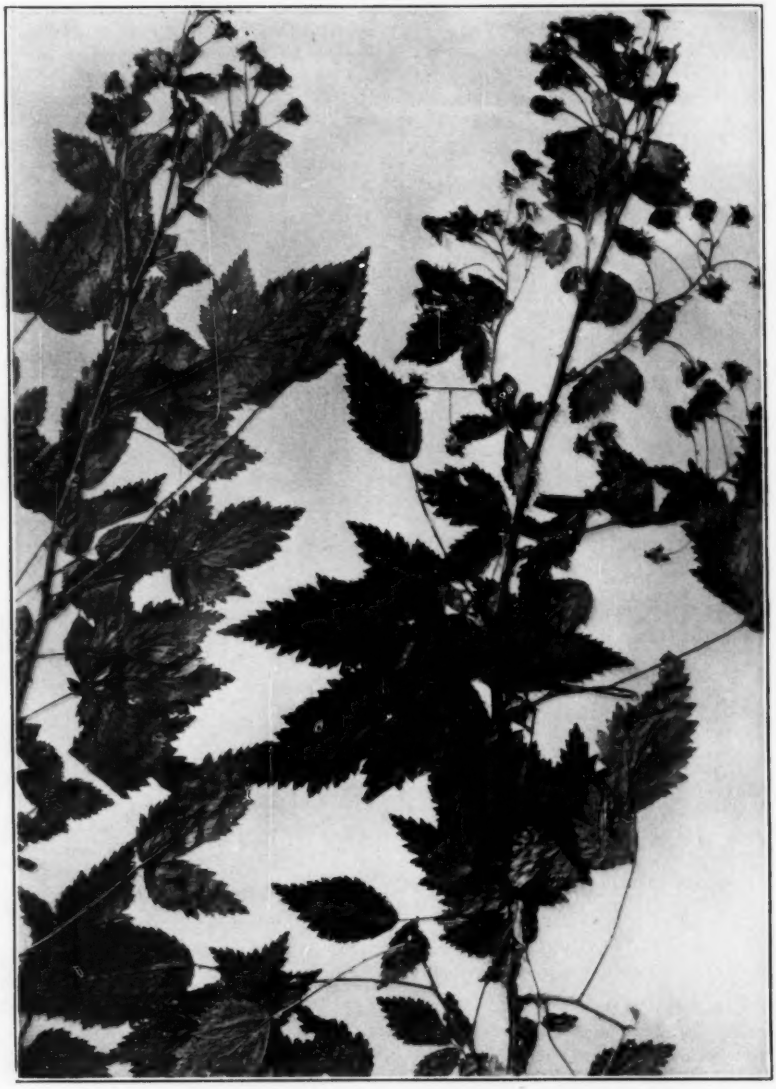

FIG. 129. FRUITING CANES OF *Rubus argutus* VAR. *scissus*.

† **R. argutus** var. **scissus**, var. nov.

Tenuiora folia gerere videtur quam *R. argutus*, foliola margine profunde dupliciterque serrata vel inciso-dentata: inflorescentia apertissima, pedicelli graciles.

Differs from *R. argutus* proper by the deeply doubly serrate-dentate or cut-toothed leaflets which are also apparently thinner; pedicels slender and inflorescence very open.—I know this plant from collections in Georgia by John K. Small, in the Ocmulgee River swamp below Macon (type), May 18-24, 1895, about Little Stone Mountain, DeKalb County, July 5, 1895; by J. H. Miller at Dunlap, in a swamp; by Irene Stuckey at Experiment, Spalding Co., a low bush in pasture.

FIG. 130. THE LONG SLENDER PEDICELS OF *Rubus ostryifolius*.

62. Rubus ostryifolius, Rydb. in Britt. Man. 497 (1901).

"Type from Atlantic Highlands, N. J." In the original description the range was "near the seashore from N. J. to N. Car." In the North American Flora, Rydberg makes it *R. argutus* × *Enslenii*, and Bicknell accredits it to Long Island and Highlands of New Jersey. I have collected what I take to be this plant under the

shade of trees at Lake Mystic, Arlington, near Boston, Mass., a diffusely erect subject; in woods, Rosslyn, Virginia, across the river from Washington, erect; on Lookout Mt., in southeastern Tennessee producing semi-scandent canes going 10-15 feet into trees and over bushes; material more doubtful in the Great Smoky Mountains, eastern Tennessee; and probably a plant collected by Beardslee & Kofoid in Swain Co., North Carolina, 1891, belongs here although the inflorescence is slightly glandular.

FIG. 131. THE SHORT FLOWER-CLUSTERS OF *Rubus persistens*.

63. Rubus persistens, Rydb. in Small Flora Southeast U. S. 519 (1903).

This species is based largely on Tracy Nos. 4108 and 4106, Biloxi, Mississippi. No. 4108 is taken as the type (Cf. Small, l.c. 1331). Both numbers are in Hb. N. Y. Bot. Gard. and Hb. Bailey. In the North American Flora (1913) Rydberg thinks the former number *R. floridus* × *lucidus* (*persistens* "as to type") and the other part of the species goes to *R. lucidus* including (acc. to herb.) Tracy 4106. The latter number represents the plant I have now taken in the wild and which I intend in the following description; whether 4108 is actually the same cannot be determined until more material is available; neither of the Tracy numbers has turions. I therefore use the name *persistens* tentatively for the plant here in mind.

Stout erect shrub forming great colonies or clumps, to 8 feet high, making many outstanding ascending terminal shoots, sheeted with smallish white short-pedicelled flowers in small clusters, glandless, the leaves on old canes softly grayish-pubescent beneath so that the plant may have something of the look of *R. cuneifolius*: prickles on turions perhaps 10 or 12 to the inch, usually straight and weak, very unequal in size, not conspicuously broad-based, these canes furrowed or angled; those on old canes stouter, usually fewer, stronger and hooked, these canes mostly terete or nearly so: turion leaflets 3 or 5, lateral ones often side-lobed and sessile or nearly so, terminal one stalked and more or less subcordate, all of them narrow-ovate or oblong ovate and acuminate, 2-3 inches long but sometimes longer, pubescent beneath, very sharply

double-serrate: flowers 1 inch or less across, about 5 or 6 in close clusters an inch or two long, petals concave-spreading, narrow and standing well apart; pedicels short (at least most of them in the cluster), pubescent, sometimes armed with sharp hooks and sometimes not: floral foliage small, the upper leaves simple, the leaves or leaflets prevailingly not exceeding 1 inch in length and usually much shorter, ovate to oblong- or lance-ovate, sharp-pointed and sharp-toothed, the side-veins prominent.—The plant I have in mind I took this year at Savannah, Georgia, in a cloud of bloom, the most floriferous Rubus I have ever seen, due not alone to the great numbers of flowers but also to the short compact outstanding clusters set close together along the branches. I have the plant also from another station in Georgia and from Clemson College, South Carolina, as well as Marion Co., Florida.

The common high-bush blackberry of Florida (aside from *R. cuneifolius*) is related to this plant, and is yet unpublished.

64. Rubus crux, Ashe, Journ. Elisha Mitchell Sci. Soc. xix, 8 (1903).
R. trux, Ashe, l.c. in separata (cf. Gent. Herb. 186).

Type locality, Dry hills, Buncombe Co., North Carolina; not reported elsewhere. A large species "forming dense thickets 2-3 m. high," with large racemes of divaricate pedicels, and broad-based straightish or curved prickles. The original specimens on which the species was based are not now available, but Mr. Ashe has loaned me material under this name from the same general region as the original but taken some years later, and it is on this material that I tentatively make *R. crux* cover the common open-field blackberry of the South. It is apparently a widespread species from Connecticut southward to Georgia and westward to Missouri. Fig. 132 from Caldwell Co., North Carolina (Randolph 1054) illustrates this plant, which has been taken for *R. argutus.* This entire range, however, must have careful study. See the discussion under *R. Andrewsianus* (No. 67).

The Early Harvest blackberry now cultivated for its fruit is of the *R. crux* kind; the original plant, according to Hedrick, was found in the wild in Illinois. Formerly, however, another plant was known as Early Harvest (Bailey, Cornell Bull. 99, 437. 1895).

65. Rubus pergratus, Blanch. Rhod. viii, 96 (May, 1906).
R. orarius, Blanch. l.c. 169 (Sept. 1906).

Type locality, Alstead, southwestern New Hampshire; abundant there and also in southern Vermont. Brainerd & Peitersen speak of it as distributed in "thickets and woodland borders at medium altitudes throughout New England." Fernald & Wiegand record it in Oswego and Jefferson Cos., New York (Rhod. xxv, 211); it grows near Ithaca. Rydberg extends its range to Iowa.

Although *R. pergratus* is described from the interior hill country and *R. orarius* from the coast country (southwestern Maine), I have not been able to find significant differences between them. Rydberg refers *orarius* to *pergratus,* while Brainerd & Peitersen think it *R. allegheniensis* × *canadensis.* Blanchard speaks of *orarius* as a "broad-leaved blackberry," but some of his specimens of *pergratus* show equally broad leaves. *R. orarius* is reported by Fernald (Rhod. xxiii, 268) from Nova Scotia and Cape Cod and identified by him from Knox Co., Maine (Kidder Rhod. xxv, 147). I do not yet know real distinctions between *R. pergratus* and *R. floricomus.*

66. Rubus floricomus, Blanch. Amer. Bot. ix, 106 (Dec. 1905).

Type locality, Southington, Connecticut, and not definitely recognized outside that state. It is one of the plants confused with *R. argutus.*

FIG. 132. SOUTHERN FIELD BLACKBERRY, KNOWN PROVISIONALLY AS *Rubus crux*.

67. Rubus Andrewsianus, Blanch. Rhod. viii, 17 (Jan. 1906).

Type locality, Southington, Connecticut. The distinctions between this species and *R. floricomus* are difficult to obtain. If one reads attentively the original descriptions under the two names, one is struck by the similarity of phraseology, even to unusual expressions, as if the notes had been written up twice. The leaflets of *R. floricomus* are supposed to be narrow and the prickles few as compared with *R. Andrewsianus*, but these characters do not hold well in the specimens. It is from the Blanchard specimens, however, that one must draw the distinctions; one notes the different inflorescences, and *R. Andrewsianus* is often a very thorny plant and it has been confused with *R. multispinus*. This variation in armature is also a feature in *R. allegheniensis* (which see).

The subject is complicated by the fact that Blanchard subsequently extended *R. Andrewsianus* (Rhod. ix, 6. Jan. 1907) to cover other plants, particularly the southern field blackberry that I now provisionally call *R. crux*. At the same time he limited *R. floricomus* to two localities in Connecticut, "southeastern part of Southington and on Meriden Moutain;" he says, however, "it is distinct enough and covers sufficient territory to make it probable that it will be found in other places." He thought *R. Andrewsianus* to be more nearly "normal" farther south (as he writes in an herbarium note) and that the plant he first described from Southington was the less typical northern extension of it. The problem, therefore, is to find out just what Blanchard originally intended in *R. floricomus* and *R. Andrewsianus* (Dec. 1905 and Jan. 1906). I have had abundant material this year from the type localities of both species, collected by W. B. Rossberg, but apparently new elements have come into the colonies in the intervening score of years.

The range of *R. Andrewsianus* is difficult to determine and we do not know whether it is separable from *R. floricomus*. The two types apparently extend from southern New England to Washington and North Carolina, and to Illinois, Missouri and perhaps Minnesota, although some of the indications may represent *R. pergratus*. I have Blanchard material of it from Michigan under a name that never was published. We may have here either a major species comparable with *R. allegheniensis* in range and variety, or a series of forms of various origins in which the resemblances are more convincing than the differences.

68. Rubus lucidus, Rydb. Fl. N. Amer. xxii, 479 (1913).

Type locality, Dunedin, Florida, Tracy 6855. Type specimen in N. Y. Bot. Gard.; co-type in Hb. Bailey. (Fig. 133).

This plant was originally described as a trailing species, and Tracy's specimens carry that aspect as they are pieces of flowering parts without turions or note of habit. I became suspicious of the trailing character, however, and made a pilgrimage to Dunedin, which is in Pinellas Co., about half way down the peninsula of Florida on the Gulf side. In the region I overtook the plant and found it to be erect or essentially so at first but the old canes may be more or less lopping, 3 feet or so, with wide-spreading branches, the lower branches from the bearing canes often long and runner-like or procumbent but not tipping; it was one of these decumbent branches that Tracy collected. I have taken it also in characteristic form farther south, at Oneco, Manatee Co.; and long ago I got it in Florida as a high-bush blackberry at St. Augustine, as 4 feet and erect at Sanford in Seminole Co., and clambering on bushes 10-15 feet high near Jacksonville, all of which have lain unnamed for nearly 30 years. What material I know credited to Alabama and Mississippi is *R. ictus* (see No. 11).

The plant is affectionately prickly, and the collector does not rapidly part company when he invades a patch of it. The elongated slender sharp-prickly pedicels are

characteristic, as well as the firm more or less persistent and dentate often shiny leaflets.

The Northey blackberry, which has been grown in Florida for its fruit, is of this species; it is said to have been found originally in the wild in Lake Co.

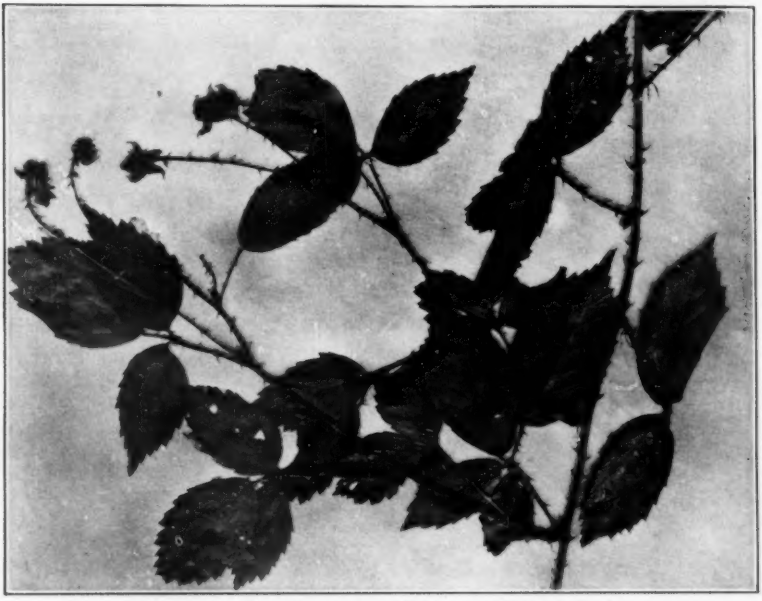

FIG. 133. FRUITING PART OF *Rubus lucidus* (CO-TYPE).

† **69. Rubus tallahasseanus**, spec. nov. Figs. 134, 135.

Planta repens longis caulibus repentibus non apice radicans, turiones erecti, foliis tenuibus, glabris, turionum apicibus exceptis, leviter glabris in venis subter folia: aculei infirmi in erectis turionibus recti, in turionum petiolis uncinati, basi aliquatenus expansi, illi graciliun veterumque caulium aliquatenus curvati; turionum foliola 5, ovato-lanceolata, longe acuminata et acute dentata, 6-7 cm. longa, 3 superiora foliola graciliter petiolulata, omnibus petiolis uncinatis aculeis armatis; aliarum partium foliola 3, anguste elliptica, pæne vel omnino obtusa, circa 6 cm. longa, foliola floralia circa 3 cm. subtus prominenter costata: flores in longis, aculeosis pedunculis vel pedicellis 1-4 ex brevibus ortis foliosisque ramulis: fructus oblongus.

Trailing and long-running plant but not tipping, and the turions erect, glabrous except on tips of turions and more or less on veins on under side of the thin leaves, glandless; old canes very slender, terete, with relatively few curved short prickles from somewhat expanded base; prickles on the turions nearly or quite straight; thin long petioles with slender hooked prickles: turion leaflets 5, ovate-lanceolate, about 3 inches or less long, long-pointed and sharply toothed, the three upper ones long-stalked and all stalks armed; leaflets on fertile canes 3, narrow-elliptic, mostly about 2 inches or less long and smaller on floral branches, nearly or quite obtuse: flowers on long prickly ascending peduncles or pedicels, 1-4 from a short leafy lateral shoot.—Tallahassee, Florida, drooping over a bank in partial shade (Bailey), making long vine-like fruiting canes.

X. ALLEGHENIENSES

Stout erect mostly tall plants characterized as a whole by long racemiform clusters with continuing rachis and divaricate pedicels, and an abundance of glandular hairs on young growths and inflorescence, some or all the foliar and growing parts soft-pubescent: there are exceptions to the elongated clear inflorescence in No. 71, but in habit and general characters the group is nevertheless fairly homogeneous: northern, with southward extensions.

A. Main flower-clusters long and open, without interspersed leaves except perhaps toward base, with continuing rachis and many divaricate pedicels. . . . . *70. R. alleghenicnsis*

AA. Main flower-clusters very leafy, the rachis usually not continued to the apex and many of the pedicels on the ascendate order. . . *71. R. alumnus*

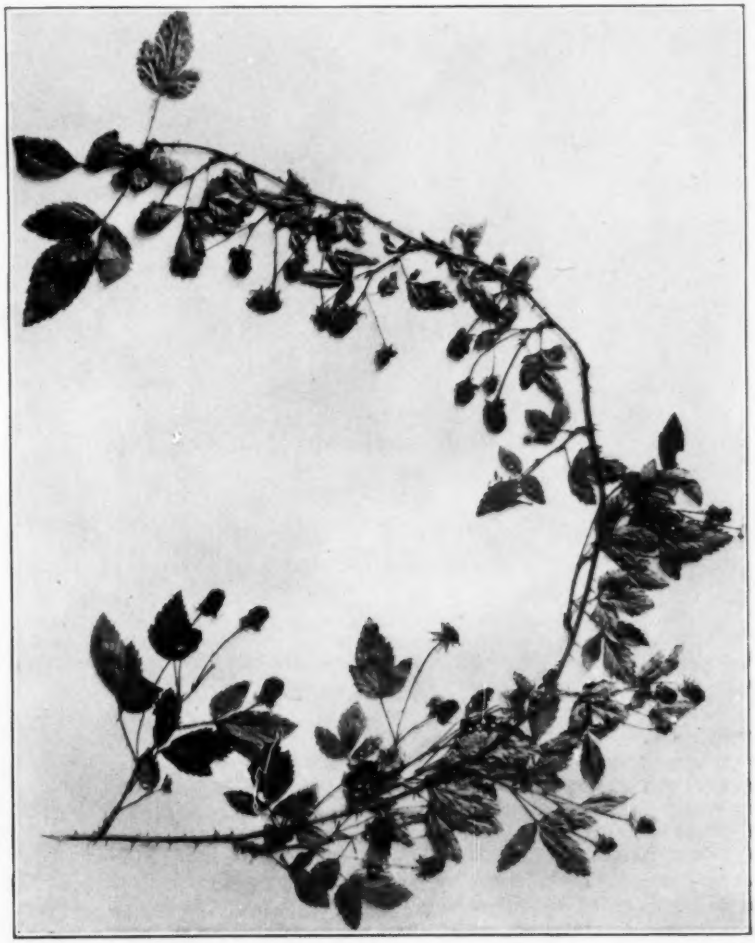

FIG. 134. *Rubus tallahasseanus*, FRUITING CANE.

70. **Rubus allegheniensis**, Porter, Bull. Torr. Bot. Club, xxiii, 153 (1906).
R. villosus var. *montanus*, Porter, l.c. xvii, 15 (1890).
R. montanus, Porter, l.c. xxi, 120 (1894), non Wirtg. et al.
R. nigrobaccus, Bailey, Sketch Evol. Nat. Fruits, 379 (1898).
R. nigrobaccatus, Focke, Bibl. Bot. heft 83[1], 313 (1914).
R. villosus var. *sativus*, Bailey, Amer. Gard. xi, 719 (1890).
R. nigrobaccus var. *sativus*, Bailey, Sketch Evol. Nat. Fruits, 379 (1898).
R. sativus, Brainerd, Rhodora, ii, 26 (1900), ad syn.

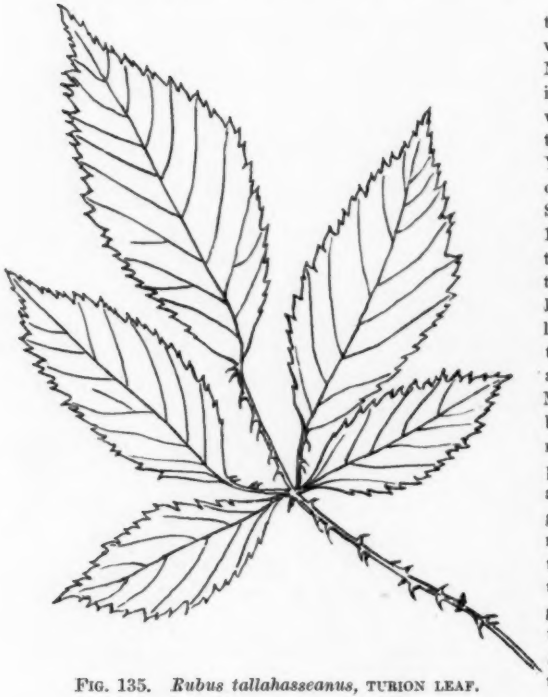

FIG. 135. *Rubus tallahasseanus*, TURION LEAF.

Type region, mountain parts of Pennsylvania, New Jersey and New York. Type specimen of *R. villosus* var. *montanus*, or cotype, in Hb. Torr. (N. Y. Botanical Garden), collected at Pocono Summit, Penn. (Fig. 136). It is a characteristic blackberry of the eastern country, in lowlands as well as highlands, from Nova Scotia to North Carolina and Tennessee, and to Minnesota and Missouri; but apparently it does not grow on the higher parts in New England and New York. In this great range it presents many forms, and we are to fear that some day these variations will be given specific names and the subject be confused. A note on the history of the nomenclature of this species will be found in my former paper, Gent. Herb. p. 185. A well developed flower-cluster, exhibiting the racemiform type of inflorescence, is shown in Fig. 137.

In its full stature, *Rubus allegheniensis* reaches a height of 5 to 10 feet, making a strong upright plant but the long canes and branches often arch or recurve although they are not prostrate or decumbent. The glandular inflorescence and younger parts is a characteristic feature, as well as the long narrow cluster and the long-pointed felt-bottomed long-stalked leaflets. On dry open lands the plant sometimes does not rise above 12 or 18 inches and the flower-clusters may then be very short although they retain their essential features. Infrequently the new canes or turions produce flowering shoots, and in such cases the blossoms are in the axils of large ternate or simple leaves, giving the inflorescence an unusual character. It varies greatly in armature, sometimes viciously armed with huge flat-based prickles. Such forms ap-

pear to be marked in parts of southern New England, where occur also similar forms of *R. Andrewsianus*. This subject needs investigation. The glandulosity also varies. On Mt. Mitchell, western North Carolina, I have found immense plants that are excessively glandular in the inflorescence and on strong growths, even the great woody canes being studded with big glands to the extent that one feels them on the hands; the leaflets are also very heavy and the margins unusually strongly serrate to even dentate.

FIG. 136. TYPE OR CO-TYPE OF PORTER'S *Rubus alleghenicnsis*.

What was supposed to be my var. *sativus* was by Brainerd elevated to specific rank, but the plant he had in mind is not mine (see No. 60). In my original description of it, published in 1890, I had no definite "type" in mind but meant to designate the form supposed at that time to be "the parent of nearly all the cultivated varieties of high blackberry," forms that in the wild had "fruit larger, loose and soft, broad, globular or globular-oblong, shining, sour until very ripe, the drupelets large and fleshy." It appears that I later conceived this type of berry to be a common inhabitant of dry open fields about Ithaca, N. Y., growing not more than 2 or 3 feet high, as these kinds of plants characteristically bear the short thick berries with large drupelets and it was supposed that only cultivation was needed to enlarge them into the garden fruits then prevailing. I have specimens of such plants taken in the wild in 1894 and 1895. In my Sketch of the Evolution of our Native Fruits, 1898, I defined the variety more definitely and stated that it "is the nondescript blackberry of open fields, and is the parent of the larger part of the short-cluster garden blackberries." I do not now accord var. *sativus* a taxonomic botanical status; but three other variants may well retain their names:

FIG. 137. *Rubus allegheniensis*, REPRESENTATIVE INFLORESCENCE AND TURION LEAF.

† **R. allegheniensis** var. **albinus**, n. st.

R. villosus var. *albinus*, Bailey, Amer. Gard. xi, 720 (1890).

R. nigrobaccus var. *albinus*, Bailey, Sketch Evol. Nat. Fruits, 380 (1898).

R. allegheniensis forma *albinus*, Fernald, Rhod. x, 50 (1908).

The white blackberry, occasionally found in the wild, "characterized by a light green or olive color of the bark and amber-colored fruits." Michigan and New York.

R. allegheniensis var. **calycosus**, Fernald, Rhod. x, 51 (1908).

R. nigrobaccus var. *calycosus*, Fernald, Rhod. iii, 234 (1901).

"Calyx composed of veiny laciniate or toothed leaf-like sepals 2-6 cm. long: lower pedicels usually elongated." Maine, New Hampshire, New Jersey, Virginia.

R. allegheniensis var. **Gravesii**, Fernald, Rhod. x, 51 (1908).

R. nigrobaccus var. *Gravesii*, Fernald, Rhod. iii, 295 (1901).

Differs in the "more slender usually prickleless canes, and the very elongate loose racemes." Connecticut, New Hampshire.

Focke separates *R. allegheniensis*, Porter, and *R. villosus*, Aiton (Bibl. Bot. heft 83[1], 89), referring *R. nigrobaccus* to the latter; *R. allegheniensis*, according to his key, has long cylindrical fruit rather than ovoid, and long open inflorescence. Of *R. villosus* he makes two varieties, one with very villous and copiously glandular parts and broad leaflets, the other a more slender plant pubescent rather than villous, with small glandular hairs or even none; the former is northeastern, the latter western. The full account follows:

"Var. *villigerus* nom. nov.: Indumentum villosum logius et densius quam in aliis formis; pedunculorum glandulae copiosæ, partim pilos superantes. Foliola lata. Videtur forma ab Aiton descripta, regiones Atlanticas incolens." "Die Var. *villigerus* anscheinend vorzugsweise im Norden (Neuengland-Staaten) verbreitet." "Var. *Engelmanni* nov. form.: Tenerior quam planta orientalis; vix villosus, sed pubescens, pilis glandulisque brevibus; inflorescentia abbreviata; glandulae stipitatae interdum desunt." "Die Var. *Engelmanni*, zuerst in Missouri gefunden, scheint häufig zu sein."

The Focke material of *R. villosus* has been kindly loaned me by Städtisches Museum, Bremen. Some of it does not represent *R. villosus* (*allegheniensis*) as now understood, and none of the specimens is under varietal name. The two names, *villigerus* and *Engelmanni*, probably represented to Focke's mind general geographical differences or subordinations. Two sheets in the collection are from Dr. Engelmann of St. Louis, although actually collected, according to the labels, at "Bayfield, Lake Superior." The more important sheet is ticketed by Focke, "Pedunc. villosi occulte glandulosi," and he probably had this in mind in making the Var. *Engelmanni*. The sheet bears a specimen in young fruit and a turion tip. The fruiting piece is a thinly villous-glandular *R. allegheniensis*. The turion tip is non-villous and non-glandular and probably is another plant: I think Blanchard would have called it *R. recurvans*. The second Engelmann sheet carries a single turion leaf of *R. allegheniensis*. Aside from the Engelmann material are specimens from Eggert, St. Louis, that well answer the characterization of Var. *Engelmanni*.

It is interesting to note in the Focke collection that he includes under *R. villosus* plants that are non-glandular. It raises the question, often in my mind, whether in fact we must not recognize glandless forms of *R. allegheniensis* and re-interpret *floricomus*, *pergratus*, *orarius* and perhaps others.

It is much satisfaction to me to have had this last intimate touch with the work of the lamented Focke; it recalls my privilege, as a young man, of visiting with him in his own country on botanical subjects of mutual interest; and he gave me then a bundle of his prized German Rubi, which is the nucleus of my collection of Old World species.

71. Rubus alumnus, Bailey, Gent. Herb. 191 (1923).

Type region, western Missouri. Type specimen in Hb. Bailey. (Fig. 88). It apparently occurs also in Indiana, and if so it is probably widespread in the intermediate region. In making this species, I placed it with the Frondosi (now combined with the Floridi) "because of its leafy flower-clusters without the elongated rachis and divaricate pedicels of *R. allegheniensis*, and very large flowers, although its gland-

ular character associates it with the latter species." It may go in either group with equal reason; but I have here associated it with the Allegheniense not only because of the glandular-hairiness but also from the tall erect habit and the felt-bottomed leaflets of the turions.

XI. CANADENSES.

Plants of various habit, known by the general glabrous or subglabrous look and glandless character, more or less lustrous leaves, smooth canes that are unarmed or bear only 6-12 prickles to the inch that are either not hooked or else not conspicuous, comprising the so-called "thornless blackberries:" leaves glabrous or nearly so beneath, or at least not soft-pubescent, the turion leaflets usually taper-pointed: inflorescence glabrate to thinly pubescent and without stalked glands, of the racemiform kind (except in AA*) with mostly divaricate pedicels: northern species, extending southward only in the mountains, and the gradations not well understood.*—Distinguished by the smooth and sleek appearance, the slim look of leaves on turions, close fine serratures, absence of glands, together with foliage, inflorescence and general habit of the Allegheniense kind. There is marked exception in the character of inflorescence in the last two species as well as in the habit; but otherwise they associate themselves here rather than elsewhere.

Apparently there are no pomological varieties in this group. The thornless blackberry of cultivation on the Pacific coast is a European plant (Cf. Gent. Herb. 197); another thornless kind is mentioned on page 297; note also the thornless dewberry, page 235.

A. Species essentially erect although perhaps over-arching at top: flowers prevailingly in racemiform often elongated clusters (very short in No. 75).
  B. Plant stout and woody, commonly more than 3 feet tall.
    C. Terminal leaflet of turion leaves, and usually the upper lateral ones, on strong growths characteristically long-stalked giving the foliage an open and lank look, and at least the terminal leaflet cordate or strongly subcordate: prickles none, or else scattered and rather short and not very sharp. . . *72. R. canadensis*
    CC. Terminal and other leaflets on representative turions not strikingly long-stalked, and the terminal one tapering or only subcordate at base.
      D. Prickles wanting or else short and not needle-like and only 5-8 to the inch: inflorescence mostly open, with very thin somewhat ascending pedicels. . . . . *73. R. amicalis*
      DD. Prickles conspicuous, often 10-12 to the inch, very slender, sharp and needle-like: inflorescence usually rather long in full anthesis, the pedicels stouter and divaricate. *74. R. elegantulus*
  BB. Plant very short, usually 2 feet or less, the canes soft and nearly or quite prickleless, with an almost herbaceous look: inflorescence of six or eight flowers or less and the lowest one or two mostly subtended by a small simple leaf. . . . . *75. R. Randii*
AA. Species strongly decumbent or even trailing (at least the bearing canes): flowers large, sometimes long-pedicelled in the axils of leaves: stems producing long branches like new canes that also bear flowers. *Multiformi.*
  B. Canes becoming creeping and tip-rooting: leaflets on turions narrow and long, essentially glabrous, long-acuminate, of the Canadensis kind: flowers partly in Allegheniensis-like clusters and partly in leaf-axils of foliaceous branches. . . . *76. R. multiformis*
  BB. Canes mostly decumbent, lopping, or lying on the ground but not creeping or tip-rooting: leaflets on turions of the ovate or broad-ovate order, long- or short-acuminate, thin and bright green, of the Allegheniensis kind except glabrous or only lightly pubescent beneath: flowers nearly all in the leaf-axils on cane-like laterals, long-pedicelled. . . . . *77. R. ithacanus*

72. Rubus canadensis, L. Sp. Pl. 494 (1753).

R. Millspaughi, Britt. Bull. Torr. Bot. Club, xviii, 366 (1891).

R. canadensis var. Millspaughi, Blanch. Bull. Torr. Bot. Club, xxxviii, 427 (1911), "a weak variety."

Type locality, "Canada." Type specimen in the Linnean Herbarium, London; (Fig. 82) shows characteristic leaves, and the fruiting part is probably the same; for a note on the specimen see page 182. The range is from Newfoundland to Minnesota and southward in high areas to Virginia and North Carolina. Var. **septemfoliolatus**, Blanch. Rhod. xiii, 193 (1911), from Newfoundland, is a "glabrous, moderate-sized bush blackberry with dark green foliage, round stem armed with numerous short prickles, and broad close leaves, the middle leaflet frequently divided into three separate leaflets making them 7-foliolate," although it "is normally 5-foliolate."

The type material of Linnæus has been variously interpreted, and it should be critically gone over again with the current distinctions in mind. Blanchard supposed (Rhod. x, 117) there are two sheets of original material, being misled apparently by the drawing in my Sketch of the Evolution of our Native Fruits (p. 383). Britton thought the Linnæan sheet bears two things, one of them being a leaf glued down on the sheet of *R. canadensis* (Bull. Torr. Bot. Club xviii, 366); and this leaf he took to represent the plant he described as *R. Millspaughi*. This leaf pasted over the other that must have led Linnæus to write "denis quinis ternatisque" (as if leaflets were in tens, fives and threes) is, however, not separate but is part of the specimen and is attached by its own petiole, there being five leaves on the specimen as separated in the drawing in my Sketch.

73. Rubus amicalis, Blanch. Rhod. xiii, 56 (1911).

R. amabilis, Blanch. Rhod., viii, 173 (1906) non Focke.

Type localities, southwestern Maine; by Rydberg accredited to Nova Scotia; by Brainerd & Peitersen referred to *R. canadensis* but the relationship is probably rather with *R. elegantulus* of which it may be a marginal form. Probably we shall recognize it over a wider range.

74. Rubus elegantulus, Blanch. Rhod. viii, 95 (1906).

Type stations in southwestern New Hampshire and southeastern Vermont, in "elevated situations in open places on dry ground." Blanchard writes that he first found it July 4, 1902 in Athens, Vt., on Bemis Hill and had watched it subsequently. I have also taken it on Bemis Hill. It is probably generally distributed in northern New England. It is reported by Fernald & Wiegand (Rhod. xxv, 211) in Oswego Co., New York.

Although *R. elegantulus* is accepted by all our batologists except Bicknell (who places it with *R. canadensis*), the species is not clear and I have been unable to follow it in the collections. Some of the material referred here probably represents *R. pergratus* or similar plants. One of Blanchard's sheets named by him and representing a cited locality is *R. vermontanus*.

R. elegantulus, Sudre, Rub. Tarn. 58 (1909) is one of the Glandulosi of continental Europe. *R. elegantulus*, Fedde (*Batidæa elegantula*, Greene), Just's Bot. Jahresb. xxxiv, p. 3, 205 (1909) is one of the Idæobati (=*R. idæus* var. *strigosus*).

75. Rubus Randii, Rydb. in Britt. Man. 497 (1901); Bailey Cyclo. Amer. Hort. 1584 (1902).

R. villosus var. *Randii*, Bailey in Rand & Redfield Fl. Mt. Desert, 94 (1894).

R. argutus var. *Randii*, Bailey, Sketch Evol. Nat. Fruits, 385 (1898).

Type locality, Mt. Desert, Maine. Type specimen in Hb. Gray. (Fig. 83); co-type in Hb. Bailey. The species has been little understood. I have now taken it in different places in Windham Co., southern Vermont, in open places, and find it to be well marked by its low stature (often only 12-15 inches high), soft canes, practically complete absence of prickles but sometimes with a few weak bristles, small narrow-ovate long-pointed sharply serrate turion leaflets, small inflorescence of the divaricate type which usually carries a simple leaf or two at its base. I have it from Franklin Co., Mass., and from old collections of Brainerd in Addison and Washington Cos., Vermont. Rydberg records it as ranging "from Nova Scotia to Massachusetts and New York." Brainerd & Peitersen refer it to *R. canadensis*, from which I think it differs distinctly. Some of my own confusion on this plant is cleared up by the separation of No. 77.

FIG. 138. FERTILE SHOOT OF *Rubus ithacanus*, FROM LIFE

76. Rubus multiformus, Blanch. Rhod. viii, 179 (1906).

Type locality, Kennebunkport, southwestern Maine. It is reported also from several places in Nova Scotia (Fernald, Rhod. xxiii, 269; xxiv, 175). Var. **delicatior**, Blanch. l.c., also described from Kennenubkport, appears not to be importantly different.

My abundant material of *R. multiformis* from Blanchard shows what appears at first sight to be more than one thing, but, not having seen the plant growing, I am inclined to think it all forms of one ill-defined species or a polymorphous group. It

often has the look of *R. canadensis*, and Fernald remarks that it may be an extreme form of *R. elegantulus*. The turion leaflets are often strikingly slender, with the three upper petiolules long, a circumstance recorded by Blanchard: "Leaves often skeleton-like; the leaflets being so long, narrow and long-stalked." The prickles are not prominent and sometimes are lacking. The plant is arching, the canes reaching the ground and rooting at the tips; Blanchard's herbarium notation on many specimens is "trailer."

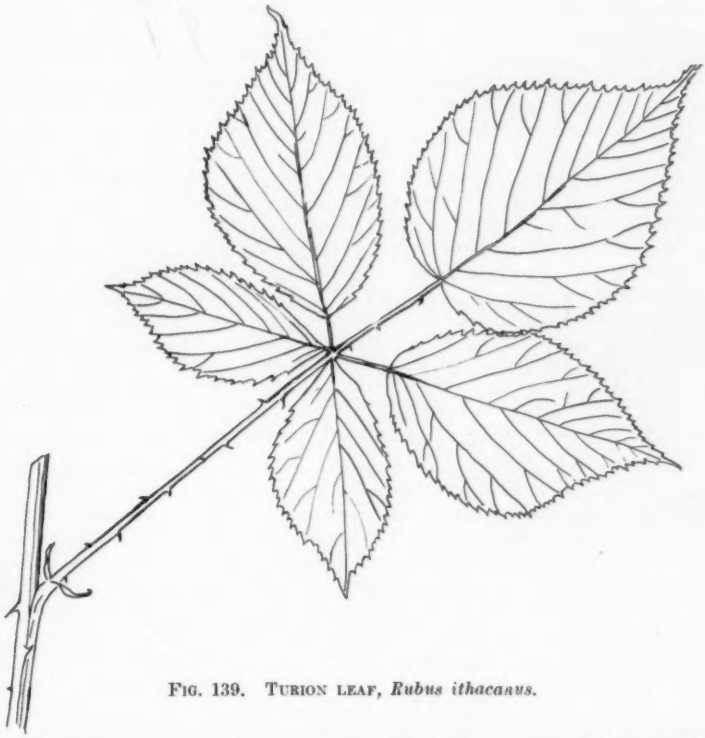

FIG. 139. TURION LEAF, *Rubus ithacanus*.

Rydberg thinks the plant *R. nigricans* × *plicatifolius*, whereas Brainerd & Peitersen regard it as made up of two hybrids, *R. Baileyanus* × *canadensis* and *R. canadensis* × *flagellaris*. Var. *delicatior* is thought by Rydberg to be *R. canadensis* × *plicatifolius*.

† **77. Rubus ithacanus**, spec. nov. Figs. 138, 139.

Planta lætevirentibus tenuibus nitidis foliis, aculeis paucis, parvis rarisque vel in nonnullis ramis nullis, interdum tenuiter pubescens interdum glabrescens, eglandulosa: turiones primum ascendentes, magna 5-foliolata folia gerentes; foliola nunc late elliptica nunc ovata, magis abrupte acuminato-acuta, tria foliola terminalia 9-16 cm. longa, longe petiolata magis minusve subcordata, supra subtusque paucis sparsis infirmisque villis, margine argutissime serrata: caules fructiferi prostrati si 1-2 m. longi, si breviores, procumbentes vel etiam erecti; folia inferiora 3-foliolata, foliola ovalia ad

ovata; folia juxta flores simplicia, magna prominentiaque, sæpe 9 cm. longa: flores plerique in unicis longis pedicellis ex axillis ortis in ramis lateralibus caulium similibus, sed interdum 4-6 flores aggregati in terminalem inflorescentiam; corolla 2.5-3 cm. lata, petala latissima; calycis lobi lati prominentesque: fructus magis minusve globosus, parvus, non speciosus, paucas drupeolas gerens.

A glandless woods plant with ascending turions: prickles few and scattered, small, or wanting on some of the shoots: fruiting canes sometimes erect when only 18 inches high and sometimes lopping, but decumbent or even nearly flat on the ground when 3-6 feet long, not rooting at nodes or tip: leaves large and thin, bright light green, sharply serrate, with few scattered weak hairs above and beneath, those on turions mostly 5-foliolate (Fig. 139); turion leaflets broad-oval to broad-ovate, the terminal one commonly subcordate and 5-6 inches long, the 3 terminal ones prominently stalked; leaflets on bearing stems 3, ovate, oval to elliptic, or on the cane-like side branches (Fig. 138) most of the leaves simple and long-petioled and bearing long-pedicelled flowers in their axils: flowers 1-1¼ inches across, in the leaf axils, or sometimes 4-6 of them aggregated at the apex of the shoot; pedicels or peduncles thinly pubescent, sometimes with a few weak prickles; petals very broad; calyx-lobes large and broad, prominent: fruit more or less globular, small, of few drupelets, not promising.—In shady ravines, Ithaca, New York; probably distributed elsewhere and overlooked. This is the plant I mentioned in my last paper (p. 183) under ***R. Randii*** as "a similar but not identical plant grows at Ithaca, N. Y." The specimens I then had were not more than two feet in total height, but since that writing I have taken much larger and more developed plants from another station and the full character is apparently now evident.

The pomological blackberries

The pomological high-bush blackberries are of two main groups,—the manifestly glandular-hairy kinds of the *allegheniensis* type with characteristic foliage, and the kinds non-glandular or nearly so of the *Andrewsianus* type; a third group contains *frondosus-recurvans* types. The cultivated varieties are not numerous. Most of them have been propagated from a single large-fruited and prolific plant found in the wild. It is commonly assumed that cultivated varieties are hybrids, but there is little foundation for this assumption. Probably we shall be able to refer most of them to regular species of Rubus when we know them and the species better.

If one makes herbarium specimens of the pomological varieties, so that they can be studied critically, one is impressed with the variation in the material. Probably some of this inconsistency is due to the confusing of stocks and labels in the long and continued processes of handling on the part of propagators, dealers and growers. I have often noted great differences, in cultivated varieties of many plants, in the botanical features in a period of twenty or more years. In some cases, particularly in plants commercially propagated by seeds, there is a continued selection so that the type gradually changes. If a person is to make a statement as to the botanical character of a cultivated variety, he must be cautious to have material that is true to name; and inasmuch as there are no real records of these plants, it is quite impossible, in the case of old varieties, to be sure of the identity. Some of the pomological varieties of blackberries belong today to different plants from those of thirty years ago.

The name Lawton is still in the trade, but I doubt whether the variety now offered is the same as that introduced 75 years ago. The old Lawton was probably *R. frondosus*. Some at least of the Rathbun of present cultivation is very different from that

of a generation ago. The botany of the original Rathbun is difficult; it has superficial resemblance to what one might think a hybrid of *R. allegheniensis* and *R. flagellaris* would be like, and I made this disposition of it in 1895 (Bull. 99 Cornell Exp. Sta. 431), but I had no real evidence. The Mersereau is a puzzling case to me. I had supposed it to be a variation from Snyder (which is *allegheniensis*); I had known the plantation of Snyder's in which a single extra good bush had appeared. I urged Mr. Mersereau (Cayuga, N. Y.) to introduce it as a new variety, and I named it for him (Bull. 99, Cornell Exper. Sta. 435). When I come to make botanical examination of the plant grown as Mersereau I find it to have a character quite unlike Snyder and one would hardly think it an *allegheniensis* offshoot.

We now need a critical study of varieties from a different point of view from the usual horticultural approach, with a purpose to determine their real botanical relationships; it would be a fascinating study to one well trained for it, and might yield unexpected results.

Pomological varieties of the *allegheniensis* kind are: Agawam, Ancient Briton, Buckeye, Early Cluster, Early King, Eldorado, Erie, L'Amoreux, Snyder, Taylor, Wilson Early. Some of these varieties run to very broad turion leaflets, but similar variations are found in the wild. Plants are sometimes nearly glandless; whether this is a variation or a mixture of stock is hard to say.

Following are glandless or nearly so, and may be associated with the *Andrewsianus* relationship (as Blanchard extended the application of this name, rather than with the *frondosus-recurvans* class) until that group is cleared up; the foliage and for the most part the inflorescence also suggest this association: Blowers, Kittatinny, LaGrange, Macatawa, Miller, Minnewaski, Ohmer, Perfection, Thornless (different from the Thornless or Burbank Thornless of Pacific cultivation), Tory, Ward, Watt. Under *R. crux*, No. 64, will be found a note on Early Harvest.

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Salvinia: 10
Sambucus: 45
Sanguisorba: 30
Sanicula: 39
Santalaceæ: 21
Sapium: 34
Sasa: 12
Sassafras: 24
Satureia: 43
Saururus: 16
Saussurea: 49
Saxifraga: 27
Schizæaceæ: 9
Schizandra: 24
Schizanthus: 44
Scorzonera: 49
Scrophulariaceæ: 44
Securinega: 34
Sedum: 26
Selaginella: 10. The item entered as "*S. tenera?*" on p. 10, has now been identified at Berlin, Dr. Maxon informs me, as *Selaginella kulingensis*, Heiron.
Selinum: 39
Semiaquilegia: 23
Senecio: 49
Serissa: 45
Serratula: 49
Sesamum: 44
Setaria: 12, 133
Silene: 22
Simarubaceæ: 34
Sinapis: See Brassica
Sisymbrium: 25
Smilax: 15
Solanum: 44, 135, 136
Sonchus: 49
Sophora: 32
Sorbus: 31
Sorghum: 132
Sphenomeris: 9
Spinacia: 21
Spinovitus: 36
Spiræa: 31
Spirodela: 14
Spodiopogon: 12
Stachys: 43
Stachyurus: 38
Staphylea: 35
Stellaria: 22
Stephanandra: 31
Stephania: 23
Sterculia: 37

Stewartia: 37
Styrax 41
Symplocos: 41

Taraxacum: 49
Taxaceæ: 10
Tecoma: 44
Ternstroemia: 37
Teucrium: 43
Themeda: 12
Thesium: 21
Thladiantha: 46
Thlaspi: 25
Thuja: 10
Thymelæaceæ: 38
Tilia: 37
Torilis: 39
Trachelospermum: 41
Trachycarpus: 14
Trapa: 38
Tricyrtis: 14
Trifolium: 32
Trigonotis: 42
Tripogon: 12
Trisetum: 12
Triticum: 12, 133
Tropaeolum: 126
Tulipa: 116

Ulmus: 18
Umbelliferæ: 39
Urticaceæ: 20

Vaccinium: 40
Valerianaceæ: 46
Veratrum: 15
Verbena: 42
Veronica: 44
Viburnum: 46
Vicia: 32
Vigna: 33
Vincetoxicum: 42
Viola: 37
Vitex: 42
Vitis: 36, 126, 135

Wisteria: 33, 135
Wolffia: 14

Xanthium: 49. Aside from the collection at Wuchang, recorded in the text, *X. strumarium* was also taken at Kioshan, Province Honan (det. by Millspaugh & Scherff).
Yucca: 15

Zanthoxylum: 33
Zea: 133
Zebrina: 133
Zehneria: 46
Zelkova: 18
Zingiber: 16
Zizania: 12
Zizyphus: 35
Zoysia: 12